



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 10, Issue, 01(B), pp. 30265-30266, January, 2019

**International Journal of
Recent Scientific
Research**

DOI: 10.24327/IJRSR

Case Report

AIRWAY MANAGEMENT IN A CHILD WITH TISSUE EXPANDER OVER NECK - A CASE REPORT

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DOI: <http://dx.doi.org/10.24327/ijrsr.2019.1001.3021>

ARTICLE INFO

Article History:

Received 15th October, 2018
Received in revised form 7th
October, 2018
Accepted 13th December, 2018
Published online 28th January, 2019

Key Words:

Airway; burns; endotracheal intubation;
tissue expander

ABSTRACT

Tissue Expanders are used in the reconstruction of various defects when there is insufficient adjacent tissue for direct closure. It can be utilised for scar revision, tissue defects, breast reconstruction after mastectomy and correction of an underdeveloped breast. When the procedure involves the head or neck, it is in proximity to the airway and may make endotracheal intubation difficult. We present a nine year old male child with post burns hypertrophic scar on the right side of the face. A rectangular silicone tissue expander was inserted in the supraplatysmal plane on the right antero lateral plane of the neck as the hypertrophic scar was on the right side of the face. After serial expansion for six months, he was posted for rotational flap cover of the post excision defect using the expanded skin. Due to the placement of the tissue expander on the neck, his mouth opening and neck movements were restricted. He could not lie in supine position due to the airway obstruction. This case of anticipated difficult airway created by the tissue expander was managed by treating the swelling like a huge mass on the anterior part of neck. With detailed and meticulous planning, the case was managed well.

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INTRODUCTION

The ability of our tissues to stretch and expand gradually over time has been observed and documented, both in physiological and pathological situations, throughout medical history.^[1]

The concept of tissue expansion is well known since ancient age. The property of human skin to stretch and expand and yield extra skin if placed under continuous stress over a prolonged period of time has been utilised for reconstructive purposes with the help of a silicon balloon inserted under the skin under aseptic precautions and progressively expansion serially by injection of sterile saline.^[2] The technique of tissue expansion is now more than three decades old and has been a value addition to our armamentarium in reconstructive surgery in all parts of the body. Tissue Expanders are used in the reconstruction of various defects when there is insufficient adjacent tissue for direct closure.

The device consists of a silicone elastomer inflatable expander with a remote silicone elastomer injection dome. The expander and remote injection dome are for temporary subcutaneous or sub muscular implantation and is removed within six months.^[3]

The principle involves subcutaneous insertion of a distensible plastic bag into an area where extra tissue is desired, the distension being obtained by progressive inflation with sterile

saline through an introducing tube and self inflating valve. This in turn, by stretching, creates the extra tissue for defect replacement.^[3, 4] Tissue expanders can be utilised for scar revision, replacing tissue defects, breast reconstruction, treatment of alopecia etc.

Tissue expansion is useful in the management of defects that cannot be closed primarily without undue tension. The observation that living tissues respond in dynamic fashion to mechanical forces placed upon them has been applied to the clinical problem of surgical defect. This technique has improved the ability of the surgeon to replace lost or surgically excised tissue with neighboring tissue of similar color, texture, sensation, and thickness. In addition, hair-bearing capability is retained, and a remote donor site is avoided.^[5] However, it still requires careful patient selection, meticulous planning and faultless execution to successfully carry out the process, which usually lasts for more than 8-12 weeks and involves several surgeries under anaesthesia. Any compromise in this process can lead to unfavourable results and complications and even abandonment of the process. Tissue expanders used in reconstructive surgeries on the head, neck and face are in close vicinity to the airway and may hinder neck movements and provide challenges to endotracheal intubation.^[6]

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CASE REPORT

A nine year old male child weighing 30kg and 140cm in height presented with post burns hypertrophic scar on the right side of the face. A rectangular silicone tissue expander was inserted in the suprapericardial plane on the right antero lateral plane of the neck as the hypertrophic scar was on the right side of the face. After serial expansion for six months, he was posted for rotational flap cover of the post excision defect using the expanded skin. The child presented with mechanical obstruction of the airway at the time of pre anaesthetic assessment. His systemic examination was normal. Airway examination revealed a mouth opening of 3 cm, restricted neck movements due to the tissue expander and normal dentition. Routine investigations were carried out. Haemoglobin was 12 mg/dL, serum urea- 19 mg/dL, creatinine-0.8mg/dL, random blood glucose-90 mg/dL, sodium-135meq/dL and potassium-4meq/dL. After pre operative fasting for six hours, he was shifted to the operating room and placed in left lateral position.



Figure 1 Tissue expander over anterior part of neck



Figure 2 X ray neck AP and Lateral view showing obstruction of airway

An IV line was established on the dorsum of left hand and ringer lactate solution was started. He was connected to a multipara monitor displaying SpO₂, non invasive blood pressure, heart rate, ECG, ETCO₂ and core temperature. He was premeditated with intravenous glycopyrolate 0.2mg and midazolam 1mg. After pre oxygenating with 100 % oxygen for 3 minutes, anaesthesia was induced with intravenous fentanyl 60 µg and propofol 60 mg.

The tissue expander was treated like a swelling in the anterior part of neck. It was gently lifted upwards by an assistant during induction. After ensuring mask ventilation and a trial laryngoscopy, IV succinyl choline 60 mg was given. The swelling was held by the assistant during induction till endotracheal intubation was achieved and was confirmed by capnography and auscultation of breath sounds. He was then positioned in supine position. Anaesthesia was maintained with a mixture of O₂: N₂O (50:50) and isoflurane 0.8 % to 1% with intermittent doses of atracurium with intermittent positive pressure ventilation using a closed circuit. At the end of the procedure, residual neuromuscular blockade was reversed with neostigmine and glycopyrolate after ensuring a TOF of 0.9. He was extubated awake and shifted to the post anaesthesia care unit.

DISCUSSION

The placement of a silicone tissue expander on the antero lateral part of the neck for anaesthetic surgery posed a problem of upper airway obstruction similar to that caused by a huge thyroid swelling. After induction of anaesthesia, further obstruction of airway was avoided by lifting the swelling away from the tracheal lumen.

CONCLUSION

This is a rare complication caused by the tissue expander due to its placement over the antero lateral part of the neck. This was inevitable but recognised and anticipatory action was taken to prevent complication.

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How to cite this article:

Rathna Paramaswamy and Milu Viswanadhan .2019, airway management in a child with tissue expander over Neck - A Case Report. *Int J Recent Sci Res*. 10(01), pp. 30265-30266. DOI: <http://dx.doi.org/10.24327/ijrsr.2019.1001.3021>
