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POSTOPERATIVE MANAGEMENT OF CLEFT LIP AND PALATE SURGERY- A REVIEW

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ABSTRACT

Background:

Cleft lip and cleft palatal defects are one of the most common birth defects with a global incidence of 1 in 700 live births. Though most of these orofacial clefts are non-syndromic, a general screening for syndromes and other organ anomalies should always be performed. With the recent progress in the knowledge of cleft repair, the procedures to correct cleft lip and palate though complex, have been simplified. It allows better outcome and to achieve even better surgical result. The procedural complications and to meet aesthetic and functional need, make this deformity a recipient of multiple procedures. This ensures that the patient is under the care of the treating surgeon for long term and allows the surgeon to follow-up, not only to provide care but also to intercept any deviation in the desired outcome. Postoperative care of cleft lip and palate surgery is largely under discussed. The commonly followed practices with suitable evidence in postoperative care of these patients are enlisted here.

Keywords: Cleft lip, Cleft Palate, Post operative management

INTRODUCTION

Orofacial cleft and child development is synergistic entities. A cleft surgeon should possess intimate knowledge of the care of the Paediatric population and the subtle signs and symptoms which may go unnoticed. Postoperative care for the cleft patient should be understood well, by detailing the types of procedures performed on those patients. The aim of this review article is to narrate the post operative care of cleft lip and palate patients which is usually under discussed **[1]**.

The procedures that may be added on as additional requirement to improve function and cosmesis to Cheiloplasty, Cleft Palate repair and ABG are as follows:

1. Lip revision to correct the lip that is not completely satisfactory.
2. Velopharyngeal dysfunction correction which is a Secondary palatoplasty procedure.
3. Orthognathic surgery for Hypoplastic maxilla.
4. Cosmetic surgeries like Rhinoplasty.
5. Surgery for Velopharyngeal incompetence.

General Postoperative Care:

The systemic need of the patient is the provisional nutritional imbalance that might be pre-existing in the patient who had undergone the surgery and the immediate requirement postoperatively. The requirement of good healing make correction of the macro- or micronutrient imbalance prudent.

SYSTEMIC PROBLEMS ASSOCIATED WITH CLEFT LIP AND PALATE

Children having cleft lip or palate suffer from some form of malnutrition which may go unnoticed. Feeding has been one of the most primary concerns in managing a cleft lip and palate patients **[2, 3]**. The nature of the cleft and the psychological trauma of having a cleft patient in the family, provides for an undernourished infant. The poor weight gain coupled with lower length/height percentile of the growing infant is an indicator of gross nutritional deficiency of the patient **[4]** if not corrected before surgery should always be corrected atleast after the surgery **[5]**. The psychological burden of the cleft is immediately crossed once the surgery is complete and the motivated parents **[6]** and family members do provide for rapid nutritional correction. The functional change of a repaired cleft lip and palate also improve feeding by reducing nasal regurgitation.

Contrary to the earlier beliefs of not bottle feeding or breastfeeding the child after lip surgery (in cases of isolated cleft lip), it is better to start breast/bottle feeding immediately after the mandatory

anaesthetic fasting hours have passed. If the child is comfortable, there will be no untoward effect on the suture line (as crying adds more tension on the closure line than suckling) **[7]**.

The palate surgery patients, however, receive feeds through a spoon, or dropper as the conventional long nipple bottles used by cleft patients preoperatively could hurt the palate. However, conventional breastfeeding can be resumed after 4 hours of surgery as the predominant nutritional source. The average age of the palate patient is also generally older thus making spoon feeds an easier option.

Malnutrition should be monitored and adequate calorie correction should be provided for an overall growth of the child and for an improved wound healing.

PROTEIN DEFICIENCY

Protein deficiency is a macro nutrient deficiency and more specific type of malnutrition. Characterized by change in colour of skin and hair, texture, stunted growth, lack of muscle mass, and oedema. These patients require postoperative antibiotic cover as they are more prone for infections. The muscle bulk during cleft lip repair might be inadequate and this might lead to a compromised outcome attributed to tension on the closure line. The postoperative care should include meticulous surgical site management to ensure satisfactory wound healing. In infants with low protein levels, a high protein-based dietary charting should be given. However, in patients with protein energy malnutrition, serum albumin-based calculations for replenishment have been followed in the PICU.

ANAEMIA

Many hospitals have documented a strong association of Iron deficiency anaemia with cleft patients. Almost one-third of the cleft lip and palate patients will present with Hb less than or equal to 10 g/dL. This has challenged many cleft centres to lower the minimum required haemoglobin level to less than 8 g/dL and also minimize the blood loss during the procedure simultaneously. The fact that children with cleft are rarely on breast feed make them more susceptible to iron deficiency. So, it would be necessary to add supplementation to all infants undergoing cleft lip and palate surgery with haemoglobin less than 12 g/dL. The ideal dosing for children between 6 and 12 months would be to prescribe hematinic syrup at the simple rate of 5 to 7 mg/kg body weight on a 10-day course without causing much gastric discomfort. In older children, the requirement could be increased to 7 to 10 mg/kg body weight in oral iron supplements.

VITAMIN DEFICIENCY (Micro nutrient)

Breast milk is usually a low source of ascorbic acid (Vitamin C), calciferols, and

tocopherols for the growing infant. Vitamin C and other micronutrients play an important role in would healing, and it also deter the quality of the skin. If identified preoperatively, supplements should be initiated immediately and should continue in the postoperative period at least till the healing is adequate **[8]**. Ideally, a dosage range of between 100 and 300 mg of vitamin C supplements for 30 days should be adequate in an infant aged between 6 and 12 months.

GENERAL CARE

Infants not on breast milk and on breast milk substitutes require calcium and iron supplements for their normal growth. These should continue even after cleft repair till adequate oral intake with recommended daily allowance is established. This has significantly avoided patient discomfort and expenditure without altering the postoperative healing in all our patients. This has largely been the practice across many centres in the world. A postoperative care nurse is assigned to each child until discharge following which a counselling session is held for the mother. Surprisingly, the bonus of weight gain and growth spurt is entirely attributed to the preceding cleft surgery, and hence adequate follow-up sessions on feeding and catch-up growth would be helpful.

PERSONAL HYGIENE

The role of personal hygiene is often missed in postoperative care. Every parent handling the child with cleft should be made to understand the basics of maintaining good oral hygiene. Instructions may need to be provided for even simple routines which could vary from washroom sanitation to utilizing clean utensils and garments. A child is more susceptible to infections after surgery **[9]** and the site of repair could also get infected if hygiene of the handler is improper.

SURGERY-RELATED POSTOPERATIVE CARE

CLEFT LIP REPAIR (CHEILOPLASTY):

Immediate care:

1. Lip dressings: The lip should be gently cleaned with a wet Q tip bud/cotton pellet in the direction parallel to the scar to avoid serosanguineous crusting. A drop of clean water over an antibiotic soap can be used to clean the suture line by the caregiver at home.
2. An antibiotic ointment should then be applied thrice daily over the sutured site for 2 weeks. The suture removal or trimming is done on the 6th to 7th postoperative day and mild sedation may be required for infants. Care should be taken to

keep the sutured site moist at all times with the antibiotic ointment.

3. Avoid direct trauma

Delayed care:

I. Scar management. The cutaneous scar of a cleft lip can never be completely eliminated. Based on the technique of repair, a characteristic scar always remains. The two most popular techniques in the world are Tennison–Randall and Millard's technique. The Tennison–Randall technique provides for an adequate length of the lip Post-surgery. However, it creates horizontal scars on the cutaneous lip. On the other hand, the Millard's technique creates a simple uninterrupted vertical scar along the Philtral column which contracts due to the lack of a break point in the scar. Both these scars need meticulous care **[10-12]** in the postoperative period.

Massaging the fresh scar is a practice that many centres advocate. Though the exact mechanism of how it helps reducing thick scarring is not known. It is believed to break the subdermal collagen fibre bonds, improve circulation, and in turn reduce the thickening of the scar.

Massaging should be initiated only after the surgical site has completely healed and all the sutures have fallen. In case of dehiscence of the wound, defer the massaging till healing is complete. The strokes for massage should start with gentle pressure of the thumb swiping down from the columella end of the scar to the vermilion. There should be very minimal blanching of the tissues during the initial healing period. The frequency of massage should be thrice a day for 8 to 10 minutes per session. The force of the massage can be gradually increased. A lubricating gel (vitamin E gel) or coconut oil can be used to massage the scar **[13]**.

II. Silicone gel application **[14]**. The benefit of a silicone gel can be seen in a scar not older than 2 years and should be applied for at least 6 months for optimal benefit.

III. Contracture management: Millard's repair has a higher rate of scar contracture. The modifications of the Millard's technique have eliminated the alar incision but the Philtralcolumn is where the contracture occurs and the patient generally ends up having a thick scar and short lip length with vermilion notching. Massaging the tissue ensures that the contracture is minimized and the scar is rendered more acceptable. Massaging an old

scar of 6 months for a period of 6 months can surprisingly also reduce the amount of peaking related to scar contraction.

IV. In bilateral cleft lip surgery, the nasal airway is kept patent by introducing nasal stents for 3 days to allow the oedema to settle down and avoid concentric healing at the nasal suture line.

2. CLEFT PALATE REPAIR (PALATOPLASTY):

a. Immediate care **[8]**

I. Importance of positioning: The patient should always be kept in a lateral or prone position after the surgery to prevent aspiration of the blood that might trickle down the lateral edges of the closed palate. In cases of isolated cleft palate, there might already be an element of associated mandibular retrognathism and high anterior larynx. This may predispose the child to aspirate postoperatively. The relatively narrowed airway from a newly formed soft palate and the tongue fall associated with mandibular retrognathism may warrant close observation and measures to immediately secure the airway in case of upper airway obstruction. In retrognathic patients, where the airway distress is anticipated, a tongue stitch could be placed intraoperatively to position the tongue anteriorly in the event of any respiratory distress **[15]** until such time that the patient completely recovers from the effects of anaesthesia.

II. Salivation: The parents need be informed about excessive salivation that occurs after cleft palate surgery. The saliva tinged with blood may add to the apprehension of the parents since they would consider the entire volume to be blood. In an attempt to wipe/prevent bleeding, more damage could be done by either injuring or infecting the operated site, when using a cloth or gauze. The instruction ought to be clear that the patient or attender under no circumstances should try and manage what they might consider as bleeding. The best possible care at that point would be to keep the patient in a lateral position and ask the health care provider (doctor/nurse) to check for any bleeding.

III. Maintaing proper Oral hygiene: The suture line tend to accumulate milk, semisolid food particles, and plaque. Encouraging the parents to give their infants large volumes of water, most importantly after any feed, would

keep the suture line clean and hydrated.

Adult patients are advised to avoid rinsing or spitting vigorously for the first 24 hours, following which a mild medicated mouthwash would provide adequate oral hygiene and prevent accumulation of debris around the suture line.

IV. Diet: The patients would generally be advised to eat a soft diet and avoid anything hard that may hurt or pierce the newly repaired cleft palate **[16]**. The first 24 hours are crucial and special care would have to be taken to avoid intake of hot and spicy food or liquids. Foods with a sticky constituency are especially notorious for accumulating around the suture line **[17]** and are best avoided.

3. CLEFT ALVEOLUS BONE GRAFTING (SABG)

Donor site care

The most common site for bone graft harvest is the iliac crest or Calvarium. The anterior iliac crest can provide good quality cancellous bone and is the preferred site for harvest. If the operative techniques are carefully followed, the complications of cutaneous sensory disturbance or gait disturbance is avoided **[18]**.

The general postoperative care for donor site would include

I. **PAIN MANAGEMENT:** Donor site pain is often the most common reason for longer hospital stay and poor ambulation of a cleft patient. Hence, pain management in the first 12 hours is crucial for improving the overall management of pain and also provides for faster recovery. The pain management comprises of using Paediatric Visual Analogue Scale (VAS) for ideal medication and dosing interval. Appropriate analgesics in the form of suppositories and transdermal patches may be preferred in children.

USE OF LOCAL ANAESTHETICS: The analgesia provided by long-acting local anaesthetics has the major advantage of reducing pain in the first 12 hours significantly **[19]**. This has proved to reduce the overall VAS score of pain in the postoperative patients. Patients who receive long-acting local anesthetics have faster ambulation and shorter hospital stay. A long-acting local anesthetic (1 mL/kg of 0.25% bupivacaine) would be ideal when injected into the site immediately after the surgery. A slow infusion through catheter of long-acting bupivacaine is also one of the treatment options for pain control.

Transverse abdominis plane blocks **[20]** have an advantage over other methods by providing a longer pain control with the same local anaesthetic bupivacaine when iliac crest cancellous bone is harvested. The drug is delivered through a 50- to 80-cm long needle and can be ultrasound-guided into the plane between the internal oblique and the transverse abdominis. It anesthetizes the peripheral nerves in the anterior abdominal wall (T6–L1). This provides for adequate pain relief and much lower VAS, thus improving ambulation and hospital stay.

II. **CARE TO AVOID DIRECT TRAUMA:** The patients undergoing secondary bone grafting are generally in the age group of 8 to 10 years. The instructions for these children during postoperative care should be to avoid running and swimming for 4 weeks, and avoiding contact sports and cycling for 6 weeks.

III. **MANAGEMENT OF SCAR:** Similar to lip repair, the tendency to form hypertrophic scar is higher for iliac crest harvest owing to constant friction with clothing and irritation and hence patients may be adequately consented.

4. CLEFT ORTHOGNATHIC SURGERY AND DISTRACTION OSTEOGENESIS:

mMxillary hypoplasia is a common stigma of cleft. The correction of the skeletal discrepancy requires Orthognathic Surgery or Distraction Osteogenesis. The postoperative care in these procedures is mainly to reduce the inflammation that occurs after a bony procedure **[21]** and provide care to the recently fixed jaws. The initial care would involve ice packs, anti-inflammatory medications, soft diet, and a special care to avoid any contact sport. Routine oral hygiene may be practiced to prevent any Hardware related infections.

In patients with distractors, care should be taken to avoid any damage to the distractor frame or using excessive activation forces that might change the bone response.

The distractor frame skin entry points should be coated with antibiotic ointments for a period of 2 weeks until the skin seals around the pins. Collateral injury from the frame to the patient or caregivers may be avoided by allowing soft plastic molds to cover the exposed metal ware.

5. VPI CLOSURE:

A. Most patients who undergo velopharyngeal incompetence surgery are admitted to the surgical intensive care unit for the first 24 hours after surgery because of a perceived breathing difficulty on

account of closure of the wide nasopharynx or for minimal chances of bleeding and aspiration.

B. The pharyngeal flaps can become sufficiently Oedematous due to the handling and hence a late intraoperative dose prior to extubation of intravenous dexamethasone may be helpful to prevent oedema and breathing difficulty.

C. The care of these patients would be similar to the cleft palate patients along with a swallowing therapist support for 1 week to prevent nasal regurgitation from uncoordinated palatal movements.

CONCLUSION

The basic principles of postoperative care for patients with cleft lip and palate are although similar in many regards to other head neck procedures, but they are also unique since the procedures are performed in different age groups and for different types of tissues (soft to hard) simultaneously. A basic understanding of the procedures and the healing process helps provide timely support and care for patients undergoing cleft lip and palate procedures.

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