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Review Article

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Pre and Post-Operative Care of Children with Cleft Lip and Palate

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ABSTRACT

Cleft of lip and palate (CLP) is the most common serious congenital anomalies, which affect adversely the orofacial region functioning. This defect can occur either in combination or in isolation or along with other congenital deformities resulted particularly, maybe a congenital heart diseases. Patient with orofacial cleft deformity needs to be operated at a lesser age and at a right time to achieve functional and normal well-being. Successful management of those in-born children with a cleft of lip and palate requires coordinated care through the oral/ maxillofacial surgery, genetics, speech/ language development, nutritional values or improvements in the parent-infant relationship. This article aims to review the highlighted points for primary care physicians concerning literature knowledge of about cleft lip and palate. In this review, some major points discussed the cleft lip and palate of facial regions, therapy and its management.

Key-words: Cleft, Lip, Congenital disorder, Nasal-maxillary passage, Orofacial, Palate

INTRODUCTION

Cleft of lip and palate is the most common congenital defects which affect the orofacial regions. A cleft is a congenital space or gap created in the upper lips, alveolus, nasal floor or palate. In most cases children, who have a cleft lip with a cleft palate or without it usually seen in 1 in 600 populations? A cleft palate alone considered as a separate entity, which means its occurrence in 1 out of 2000 live births [1]. Therefore, current estimates of around 35,000 children had cleft lip and palate congenital disorder every year in India [2]. Failure to fuse or space is created while fusion of nasal and maxillary processes within the palatine shelves arises during 8th week of the embryonic development may create a cleft of varying extent through the nasal, alveolus and upper portion of lips, it may be complete or incomplete.

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Majority of 275 congenital distributions [3] had left lip (CL) and cleft palate (CP) syndrome. That's why multiple co-morbidities coexist in these patients. Anaesthetists are mainly concerned with cardiac and airway abnormalities.

Syndrome patients with mandibular hypoplasia make airway management difficult and 5-10% may present with congenital heart disease [1]. Those Infants have orofacial deformities are generally concerning with number of additional abnormalities such as dentition/hearing defect, recurrent ear/upper respiratory tract infection (URTI), as well as pulmonary aspiration with malnutrition problems. Patients with orofacial abnormalities need special attention and adopted recent criteria to repair cleft associated problems especially in infants who had 10 pounds of weight, 10 weeks of age and haemoglobin of 10g% [4]. This recent concept of early cleft repair in newly born children is based on the number of specialities factors such as improvements in parent-infant relation, feeding behaviour, infant-growth and speech/ language development [4], oral/ maxillofacial surgery, genetics and other factors.

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A neonatal surgery is avoided in children with CLP syndrome unless it is for non-cleft operations. Most congenital abnormalities can be detected if we wait for 3 months which allows anatomical and physiological maturation[5]. This cleft deformity needs to be examined as earliest as possible or early age to achieve functional and normal well-being. But CLP defects treatment is usually needed a medical expertise team involving a team of experts of surgeons and physicians, speech/ language experts and Ear Nose Throat (ENT). Because of the treatment process is quite complex and intensive care is needed during surgery of patients with a CLP and it is performed in between the 1-2 years age of children [6]. As we already discussed the children with CLP had the additional disease of the respiratory tract with microcytic anaemia or associated with a high risk of malnutrition, all these events are just because of difficulties facing during the feeding [7,8] of breast milk due to abnormalities developed in upper lip portion. The reason behind this event is due to the creation of negative intra-oral pressure while feeding of milk and is predisposed to regurgitation and aspiration due to the palatal defect [8]. Delayed wound healing is usually observed in the postoperative period because of malnutrition and anaemic status while respiratory-tract infection. It may predispose off these patients to develop the laryngospasm, bronchospasm and hypoxia conditions during the intake of general endotracheal anaesthesia. This situation arises because of the hyperactivity of the airway [9] passage. Therefore, it is crucial to treat such patients medically before underwent to surgery or intake of anaesthesia doses before surgery, to avoid blockage of the respiratory tract. Care of a cleft patient requires lots of attention against serious factors. In the early stages of the disease, they need parents attention, then feeding and then with the surgery and finally speech therapy and possibly orthodontics. The pre and post-operative care of these patients are crucial to their survival and the success of the surgery. Surgery for a cleft lip/palate is elective as a baby with a cleft lip/palate can live to old age without surgery so it is imperative to learn to take care of these patients and guide them through the perioperative course safely. This review aims to enumerate the preoperative and postoperative concerns and management of a CLP child.

Pre-operative Preparation- Surgical operation to treat the cleft lip defects within the 3-6months and within the 12 to 18 months to repair the cleft palate. The surgical procedure depends on the surgeon's personal preferences and techniques. Actual aim to reduce the cleft width size, align the cleft lip and alveolar segments in an ordered way and correct the cleft-specific nasal airways [10].

Several enlisted goals of pre-operative nursing care:

1. Safe preparation of the child for surgery
2. Making the child stress free
3. Counselling parents regarding surgery and post-operative care

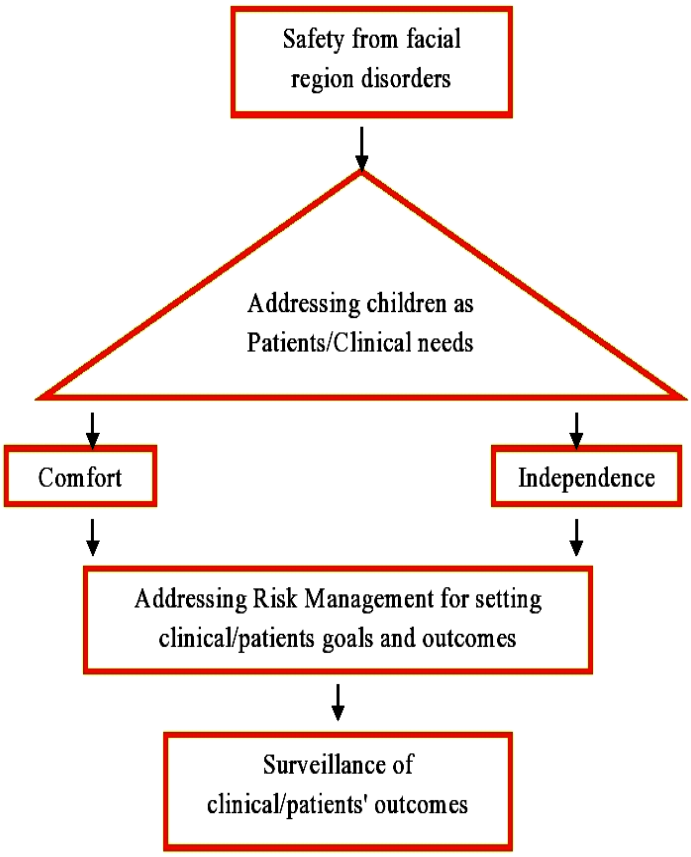

Fig. 1: Diagrammatic way of Representation of Pre-operative nursing care

In addition to the standard preoperative history requires medical examination with coordinated attention is needed to access the complex congenital abnormalities:

Associated congenital abnormalities- CLP combined linked with 150 known syndromes, therefore; a careful clinical examination should be needed to access the deformity level. The three main characteristics with cleft palate, micrognathia blocked an upper-respiratory-tract causing airways and feeding is seriously blocked which constitute the Pierre-Robin Syndrome. Other associated

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facial anomalies are included: Goldenhar and Treacher-Collins Syndrome [11].

An array of preoperative problems in cleft lip and Palate children is displayed here:

Upper Respiratory Tract Infection (URTI)- CLP patients have chronic rhinorrhea with URTI due to difficulties in food reflux into the nasal passages. Incidence of postoperative respiratory complications (PRC) is reduced with the administration of preoperative antibiotics. Significantly higher rates of PRC (9%) are seen in infants with bilateral CLP as compared to unilateral CL or in CLP with a 2 to3% PRC rate respectively, even with no clinical sign of scoring pre-operatively which indicate the no clinical sign of infection [12].

Chronic Airway-Passage Obstruction- Snoring, apnoea like signs appeared during milk feeding or protracted feeding time clearly may indicate a chronic airway-passage obstruction. Increased risk of airway obstruction due to oversensitivity to sedatives may be observed in the peri-operative period. Older children and adults may have chronic hypoxia, right ventricular hypertrophy and corpulmonale like symptoms arise which leads to congenital heart disease in 5-10% patients. Other recommended techniques like ECG and ECHO should be considered if cardiac problems were suspected in patients [13].

Nutrition and Hydration- An optimal current nutritional status of children can be solved by accurate measurement of supportive feeding. Height and weight measurement can be done accurately to appropriate dosages of drugs and fluid, being administered to CLP patients. A child with cleft lip and palate (CLP) defects can have difficulty to suck breast milk. Usually, this feeding difficulty is commonly observed in these children and it should be recommended surgery because of deferred malnourished or in dehydrated children. Nutritional or physiological anaemia mayoccur at 9-weeks interval that's why haemoglobin (Hb) measurement should be checked frequently. Ideally, all studied patients have haemoglobin (>10g/dl) concentration. Clear fluids intake can be prescribed in 2-hours preoperatively and exclusively in breast-feeding infants until 4-hours preoperatively [14].

Pre-medication therapy- Sedatives may be prescribed to precipitate airway passage obstruction, otherwise, it should be avoided. Atropine is an effective anticholinergic and recommended drug whenever any difficulties is in the upper respiratory tract or dosing of anaesthesia in combination with ketamine (20 µg/kg) is recommended either through an intramuscularly for 30 minutes pre-operatively or through an intravenously dosing (10-20 µg/kg) at induction phase of administration of drugs [15].

Anticipated difficult intubation- A difficulties in airways passage to be operated are especially observed in those patients who have <6 months aged with either having retrognathia (receding lower jaw) like problems or with bilateral clefts. In addition to this, about known allergies can also be described in this report. Pre-operative fasting must be prescribed by physicians for 2 hours to clear up liquids in all the age groups, while at least 4hours for breast milk and 6hrs for solids feed intake. The timing and nature of last oral intake should be noted. And all these problematic issues must be identified first and then treated. Also, check for any chronic ailment or genetic problems. Ensuring that all documentation and checklists are complete before the child leaves the ward. Because the children and their parents are very apprehensive, psychological care of younger children focuses on limiting painful procedures and anxiety caused by separation from carers [16].
If the hospital policies can allow children with their parents, the presence of the parent in the anaesthetic room or operation theatre during induction of anaesthesia in children may help reduce their distress situations. It may be appropriate to introduce them to another family whose child is recovering from the same surgery. This will help carers understand the changes that they can expect to see in the early postoperative period.

Post-operative Care- Under the postoperative situation, patients were under close observation to avoid blood losses or airway passage obstruction and promote to easy access of recovery from this critical situation, and only those one returned to the ward in a fully awake condition. Each patient should be given sufficient supplemental oxygen until the child is in a fully awake condition with additional analgesia (*i.e.* intravenous

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route administration of morphine) can be carefully administrated to these patients [17].

Intra-operative and postoperative analgesia treatment can be administrated to patients with infiltration of local anaesthetic and adrenaline either through surgically or prescribed to use infra-orbital blocks paracetamol syrup is recommended regularly in the ward postoperatively. Some safety precaution must be operative for those CLP patients who are under close observation under the Jam pack situation, as usually observed in hospitals or limited staffs inwards; the usage of opioids is avoided. To avoid the situation of the high incidence of postoperative airway complications, it should be recovered safer or adjacent them to the operation theatre until they are in fully awake [14,16] situations.

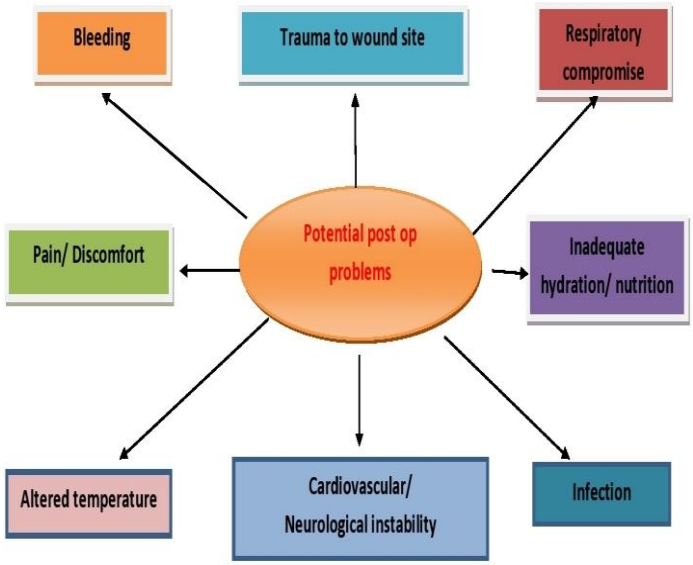

Fig. 2: Potential Post-operative nursing issues

Many potentially devastating complications can occur during emergence and recovery from anaesthesia. Monitoring is essential for the early detection of post-operative complications. CLP surgeries show better outcomes with optimum pain management. Multimodal therapy with Opioids, non-opioids and infra-orbital nerve blocks are mainly used. The infra-orbital nerve provides sensory innervation into the skin and upper lip mucous membranes, cheek, lower eyelids and nasal alveolus. Blockage of the infra-orbital nerve provides relief from pain in most of the tissues affected by a (CL) repair. In the 2016 year published Cochrane review on infra-orbital nerve blockage during the (CL) repair studies, which demonstrated its efficacy in terms of lowering the opioid consumption during the surgery and counting the lower pain scores in the post-anaesthesia care unit [18].

Recognition and Management of Post-operative Complications- Following problematic complications arise frequently in cleft children while operating surgery in the nasal-airway passage:

Residual sedation- CLP Patients were recommended to anaesthetic drugs along with potent sedative drugs. Few of these children may metabolise the drugs slower than expected. This may result in prolonged sedation following surgery. This treatment is purely supportive. Ensure the airway is clear, do a chin lift and jaw thrust and place the patient appropriate position. Additionally, if required give oxygen either via a face mask or nasal prongs [19,20].

Forgotten pack- Throat pack is aseptically removed before the child is in fully awake mode. If missed it will obstruct the airway and the child will have difficulty breathing and might activate the gag reflex. Sometimes the child will have complete obstruction of their airway and have a respiratory arrest. It is important to diagnose the problem emergently and facilitate removal of the pack [21-23].

Laryngospasm- Laryngospasm during recovery occurs sometimes if the child is in lighter planes during extubation. Any blood or sputum near the vocal cord acts as an irritant leading to reflex adduction of vocal cords. This may lead to airway obstruction and hypoxemia. Immediately call for help, support airway and give oxygen. A forcible jaw thrust and pressure on Larson's point sometimes relieves the laryngospasm. Unexpectedly, still, the condition does not improve in the child, then it may need intubation of following a dose of propofol or succinyl choline [20,21] drugs.

Airway obstruction- Airways blockage can occur due to a combination of factors such as edema in the tongue, laryngospasm, retained throat pack or blood clotting. The lateral position with CPAP for a short period may be considered as an effective one. Nasopharyngeal airways (NPA) are especially observed to well tolerate in those patients who are at a high risk of postoperative airway complications or they may be inserted before emergence. The NPA can usually be removed immediately the following day once the swelling has subsided and the child has mastered to inhale through the mouth. The only option is to avoid operating oropharyngeal airways while surgery because of the high

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chances of disrupting air passage. Instead of this, an only small number of infants needed re-intubation and possibly tracheostomy [19-23] like advanced technologies.

Bleeding- An excess of bleeding is examined after the cleft palate surgery from children who had continued dribbling of blood from the mouth or it may restrict the airway passage. In this condition, additional support and care are provided to those children who needed excess quantity of oxygen with a face mask, with fluid resuscitation and place them in the left lateral position and stay head down to allow the blood to drain and prevent them to aspiration. Suction the mouth cautiously, entering closely to 1cm asides of the mouth. Compress any visible bleeding points with gauze, ensuring that it does not cause any further airway obstruction [21-23].

Laryngeal Oedema- This type of anomaly develops when the true or false vocal cords, both are in the swollen state. It happens due to difficulties intubation or placement of an oversized endotracheal tube. This is an emergency and needs the assistance of the anaesthetist. In the meantime, it supports the airway passage and releases out oxygen additionally equipped with a well-sealed mask (Ambu-bag). Sometimes, nebulized epinephrine (adrenaline) intake of (0.5 mg/kg) in 3 ml of normal saline will relieve from oedema temporarily. Dexamethasone dose of 0.1-0.25 mg/kg is given intravenously if it has not already been given in operation theatre at induction [21-23].

Bronchospasm- Bronchospasm is due to constriction of the muscle around the bronchioles. It is usually exacerbated by using certain drugs. Children with upper respiratory tract infection are more susceptible to post-operative bronchospasm. This may be avoided spontaneously with oxygen via a face mask. However, if the child develops an audible wheeze, a tracheal tug or sub-costal recession and looking restless then it is operated with nebulized (2.5 mg) salbutamol in a 3 ml of normal saline. An intake of Dexamethasone of 0.1-0.25 mg/kg is given intravenously to them [20-22].

Aspiration- A baby with a cleft palate has an abnormal swallowing mechanism and hence is susceptible for aspiration of saliva, blood and feeds. This makes the baby prone to developing a chest infection. They may have added breath sounds and have low oxygen saturation on room air. Baby is to be oxygenated. Antibiotics are to be started as per protocol. Feeding is to be commenced once the baby is awake and can control their airway. Mothers must be supervised and taught how to feed a baby safely post cleft palate repair [19-21].

Fever- Majority of children develop a fever postoperatively after administration of atropine drugs given in an operation theatre. This usually resolves spontaneously. If the fever persists, start tepid sponging and antipyretic drug treatment is prescribed to them. Appropriate antibiotics can be commenced [18,19,22] to avoid this situation.

Hypothermia and Shivering- Children usually lose the ability to conserve their body temperature because of the low temperature and anaesthetic drugs affect. Before the age of 3 months, children don't have a shivering mechanism and therefore is more liable to become hypothermic. In this situation, they release oxygen, warm up with a blanket and avoid using cold fluids [20,24].

Post-operative nausea and vomiting-Post-operative vomiting in children can be distressing one. To avoid this situation, one should administrate the proper supply of oxygen, delay in the oral intake and continue intravenous fluids. If found the very severe situation, an antiemetic can be recommended [25,26].

Agitation- Agitation should be operative in hypoxia, pain, hunger, and separation from care, un-comfortable environment situations or certain children reaction against the drugs like sedatives. Fully access clinically those patients and reason for causing it [19, 21,27].

CONCLUSIONS

The present study concludes the vigilant post-operative care is essential for good surgical outcomes. It starts in recovery and continues in the ward. It requires vigilance and careful regular observation of the child. All observations must be documented clearly to appropriate management and measurement can be implemented easily. Airway complications constitute the most common postoperative complication arises especially in children of less than 12 months of age. Children and babies with clefts are susceptible to more to upper respiratory tract infections which impaired airways and

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increase the chances to develop the post-operative respiratory complications. Children with this disorder have high chances of risk so rapidly, that's why they are recommended to recover them as soon as possible to monitor regularly. Careful selection of the patient undergoing cleft surgery to gain a favourable outcome. Expertise anaesthesiologists should be preferred choice to manage the kinds of critical cases and hospitals should be equipped with all the facilities resources to handle the cases with care.

CONTRIBUTION OF AUTHORS

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