



Fabrication of Interim Obturator After Marsupialization – An Exigent Case Scenario

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Abstract

Surgical obturator and interim obturators are fabricated before the surgical intervention in usual scenario to avoid the difficulties faced during impressions in open surgical wound. This case report describes the fabrication of interim obturator in a child patient aged 9-year-old reported with an open wound after marsupialization. Various challenges were faced starting from the clinical examination till insertion of the appliance such as complex anatomy of the defect, making an accurate impression of an open surgical wound and behavior. Technique of Cryoanalgesia (2-4 degree Celsius) was followed throughout the impression procedure. A helical spring incorporated interim acrylic resin obturator was fabricated. Considerable healing of soft tissue was seen at the end of 1 month and bony healing was observed at the end of 3 months follow up. This case documents the role of obturator in early healing of the lesion as well as the management of challenges that are faced during the procedure in such unique case.

Keywords: Obturator; Marsupialization; Dentofacial; Cryoanalgesia

Introduction

People with dentofacial abnormalities experience greater degree of social consequences such as social avoidance and being perceived as negative personality characteristics [1]. Even minor facial abnormalities such as tooth loss, or swelling can result in social stigma and stress in individual [2]. Dentigerous cyst is one such developmental cyst such will lead to various complications like facial disfigurement, tooth loss, loss of function if it goes undiagnosed in the initial period [3,4].

In the era of conservative approach in management of orofacial cysts, Marsupialization is a breakthrough to save the succedaneous

tooth from surgical removal. It is a conservative surgical intervention that decreases the size of the cyst gradually. It involves making a slit on the cystic wall by incision, evacuation of the contents, and suturing the cystic lining to the mucosa. It is a better choice of treatment for dentigerous cysts in children by promoting eruption of the cyst-associated tooth as well as evidence of early bone healing [5,6]. There were different devices used after marsupialization such as obturator, gauze, resin plug, acrylic stent, plastic button, tube [6]. An obturator or prosthetic plug is indispensable during the critical healing phase. Using obturators minimizes wound contamination and aids in healing, improves speech and mastication [7].

Fabrication of obturator depends on the site and size of the defect. Surgical obturator and interim obturators are fabricated before the surgical intervention in usual scenario to avoid the difficulties faced during impressions in open surgical wound [8]. Dental fear and anxiety are documented highest in cases of surgical procedure than non-surgical procedure in paediatric patients [9]. Making an impression in an open healing wound is always challenging [10]. Presence of healing wound with granulation tissue that bleeds easily will make this approach even more difficult to the clinician.

A residual defect with a complex anatomy with a healing wound may present a rehabilitative challenge for the dental surgeon in a child patient as fear and anxiety towards dental procedures are major problems seen among children and adolescents [11].

This case report documents the techniques and precautions taken during fabrication of interim obturator in pediatric patient reported after marsupialization.

Case Report

A 10-year-old female patient reported to the Department of Pedodontics and Preventive Dentistry with the chief complaint of open wound after marsupialization of dentigerous cyst wr t 21, 22, 23 for the fabrication of interim obturator. The patient gave a past dental history of surgical operation of cyst a week ago. The Frankl's behavior rating scale showed Negative behavior. Tell show do method of behaviour management technique was followed throughout the appointments. Intra oral soft tissue examination revealed, cystic cavity on the left side roughly circular in shape, non-tender. The tissue around the marsupialization was pink in color, lined by granulation tissue, edges showing growing epithelium, soft and friable, and bleeds easily. Cystic cavity extending from buccal gingiva of 22 to 24 which was packed with betadine-soaked gauze. (Figure 1a) Orthopantomograph (OPG) showed solitary radiolucent lesion extending from floor of the nasal cavity to the apices of 21,22,63 and 23, displaced and impacted wrt 23, distally displaced 21 and 22 (Figure 1b) Histopathology report suggested an inflamed dentigerous cyst. Technique of Cryoanalgesia (2-4 degree Celsius) was followed [12,13]. Precooled local anesthetic gel was applied. Defect was packed with precooled betadine-soaked floss tied gauze. Tissue was covered with a layer of frozen gauze piece. Primary Impression was made using precooled polyvinyl siloxane impression material (3M Express™ Regular Body, Regu-

lar Set). Primary cast was poured. Spacer was made with Marrow, Rudd, and Rhoads spacer design using 2mm thickness of modelling wax. (Figure 2) Custom tray was fabricated using self-cure acrylic tray material after blocking the undercuts with the modelling wax. (Figure 3a) Secondary impression was made with Express wash technique using precooled polyvinyl siloxane impression material (3M Express™ Light Body and Fast Set and Express™ Regular Body, Regular Set). (Figure 3b) The definitive cast was poured in Type III gypsum (Kalrock; Kalabhai). A 0.8mm round stainless-steel wire was bent to form an open triangle with a single helix at the apex and the arms extending to the labial and palatal extensions of the defect. Wire coil utilizes the space between 22 and 63 without hindering the occlusion. This helix with wire extensions was stabilized on the cast, waxed, and processed in clear cold polymerizing resin. (Figure 4) The obturator was inserted intraorally where it could easily be guided into the desired position over the narrow opening owing to the flexibility imparted by the helix, fitted snugly onto the 2 openings, and maintained in that position due to the spring back action of the helix. (Figure 5) Long-term soft liner (Silagum; DMG Chemisch-Pharmazeutische Fabrik GmbH) was applied to protect unhealed fragile tissues, especially on the medial side of the defect, and to provide some cushioning effect. The appliance was delivered to the patient and post insertion instructions were given. Recall checkup done every week. At 1 month follow up there was considerable healing of soft tissue seen. Appliance was relined and modified for the better fit. At 3 months follow up OPG revealed considerable reduction in the size of the radiolucency indicating bony healing. (Figure 6)

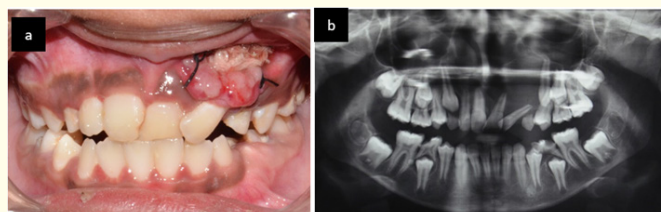


Figure 1: a) Intra oral photograph 1 week post marsupialization, b) OPG showing solitary radiolucent lesion extending from floor of the nasal cavity to the apices of 21,22,63 and 23, displaced and impacted wrt 23, distally displaced 21 and 22.

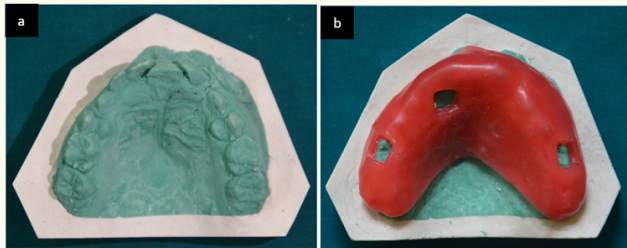


Figure 2: a) Primary cast, b) Space design - Marrow, Rudd, and Rhoads spacer design.

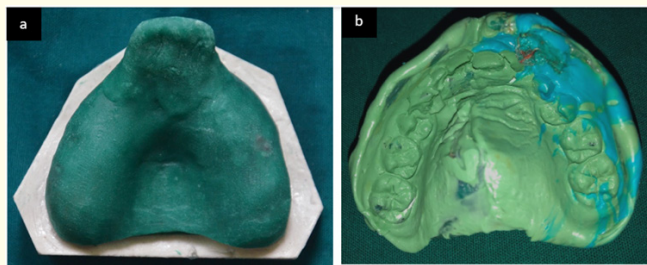


Figure 3: a) Fabrication of custom tray, b) Secondary impression with Express wash technique.

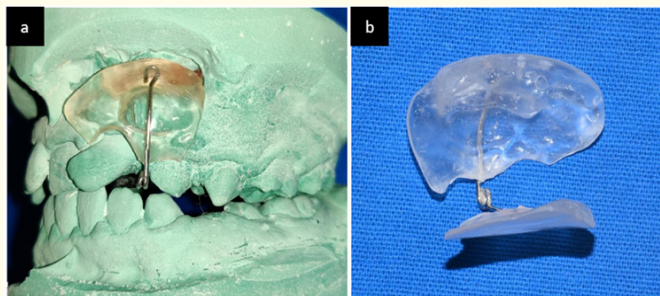


Figure 4: a) Fabrication of interim obturator, b) Interim obturator with 0.8mm helical wire.



Figure 5: Intra oral photograph - Appliance delivery.

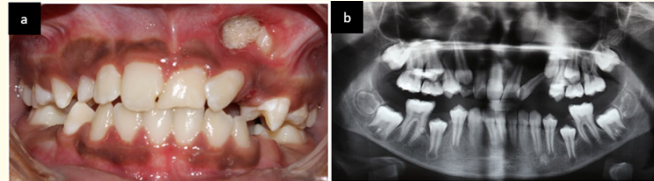


Figure 6: a) Soft tissue healing, b) OPG showing significant reduction in the size of the lesion, signs of eruption wrt 23, change in the root position (straightening of the root position) wrt 21 and 22.

Discussion

Impression procedures in children poses greater challenges to pediatric dentist. Commonly faced challenges are fear of unknown, anxiety, difficulty in understanding, sensitivity of mucosa, gag reflex [14,15]. Impressions are made before the surgical procedure in usual scenario [8]. As patient reported 1 week after marsupialization, making an impression was even more difficult due to presence of an open healing wound with friable granulation tissue that bleeds easily. Other factors were pain in surgical site, gag reflex and anxiety. Making proper impression to deliver interim obturators is vital to provide accurate fit of the obturator [16]. A technique of cryoanalgesia was followed throughout the impression procedure. Cryoanalgesia is an effective method of relieving pain and discomfort by freezing the affected area [17,18]. By decreasing temperature of skin, there will be decreased metabolic rate which enables the tissue to survive even in cellular hypoxic state. Cryoanalgesia reduces nerve conduction velocity, hemorrhage, edema and local inflammation. Precooling the injection site is a common practice in dentistry for effective management of pain perception [19]. Refrigerated gauze pack, impression material and local anesthetic gel reduced the pain perception to greater extent. Polyvinyl siloxane was the material of choice as it has higher dimensional stability and accuracy. Refrigerating the polyvinyl impression material will increase working time without affecting accuracy [12] The gauze pack that was tied with a floss prevented the risk of blocking of residual impression material in the cystic cavity throughout the impression procedure.

Effective behavior management technique is needed for the success of the treatment in a child patient. To manage the fear and anxiety of the child tell show do method of behavior management was followed. Instructing about every step employed while doing the procedure helped in reduction of anxiety [20].

It was difficult to design an obturator for the defect that was situated in the labial sulcus area due to the complexity of defect and the surrounding structure [21]. The helical spring incorporated in the acrylic resin obturator ensured a single path of insertion and allowed easy removal of the appliance. Wire used was flexible enough to provide retention for the appliance because of the spring-back action of the helix. The type of obturator used in this case was made with clear acrylic for esthetic purposes, since the lesion was in anterior region. This design increased the stability and retention of the appliance. Design ensured speech, mastication, comfort, convenience with social interactions.

An obturator is indispensable during the critical healing phase. Interim obturators are generally inserted between 10 days and 2 weeks after surgery [16]. Since the lesion was in the anterior region fabrication of interim obturator was important to retain the betadine-soaked gauze in place and to maintain hygiene around the open wound. Its use reduces the number of follow up visits as patient can maintain good oral hygiene. The main purpose of the obturator was to hold the pack in place and it prevents ingress of solids and liquids helped in maintaining hygiene. As obturator separated the maxillary surgical site from the oral, it decreased the pressure on the surrounding tissues resulting in good regeneration of tissues [16]. This ensured early soft tissue healing of the surgical site with the evidence of bone formation as early as 3 months. They have to be periodically readapted and relined to adjust the tissue changes occurring during the time of healing. Transparent design allowed clear visualization of the healing progress. Acrylic materials can be easily relined and repaired when required. This ensured good fit of the appliance at every follow up which provided patient comfort and function. Thorough post-insertion instructions, counseling and maintenance phase is important for the successful outcome [21]. Maintenance of good oral hygiene after every meal such as tooth brushing, betadine mouthwash, cleaning the appliance once a day before sleep; check of the appliance fit at every follow up visit led to rapid healing of the surgical wound.

The challenging factors in this case was the age of the patient and the open surgical wound. The amalgamation of proper clinical techniques and behavior management led to successful fabrication of appliance.

Conclusion

This case poses a challenge to Pediatric dentist due to presence of marsupialized cyst with an open wound. The technique of fabrication of interim obturator with modified impression technique and unique design of the appliance makes this approach successful.

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