

## Case Report

# Prosthetic Management of Hard Palate Perforation in a Child with Acute Lymphoblastic Leukemia

## Abstract

Palatal perforation is an uncommon complication seen in children with acute lymphoblastic leukemia undergoing chemotherapy. This may impact basic functions, such as speech, swallowing, chewing, affecting the quality of life (QOL). Prosthetic rehabilitation of the palatal perforation with obturator can optimally restore function, thereby improving and enhancing the QOL of these patients.

**Keywords:** Leukemia, maxillofacial prosthesis, oncology, palatal obturator, palatal perforation

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## Introduction

Children with leukemia have impaired immunity and are more prone for fungal infection. The infection usually involves the nasal cavity, maxilla, paranasal sinuses, and orbits. Necrosis of the palate is often seen when the fungus invades the arteries, forms thrombi within the blood vessels that reduce the blood supply.<sup>[1]</sup> Fungal pathogens are subdivided into those that remain superficial (i.e., restricted to the epithelial surface) and those that invade deep organs and tissues (deep fungi). Invasion of surrounding tissue can cause necrotizing the ulceration of palate with a blackish slough and exposure of bone.<sup>[2]</sup>

Treatment may require resection of the palate, maxilla, and facial tissues to remove the extent of necrosis. If the patient survives, the resulting defect needs prosthesis to close the defect which is termed as a maxillary obturator. An obturator (Latin: *Obturare*, to stop up) is a disc or plate, natural, or artificial, which closes an opening or defect of the maxilla as a result of a cleft palate or partial or total removal of the maxilla for a tumor mass.<sup>[3]</sup>

The goals of prosthetic rehabilitation include separation of oral and nasal cavities which helps to improve the basic functions, such as speech, swallowing, chewing.<sup>[4]</sup> These defects are more difficult to restore because they are generally lined with respiratory mucosa and poorly keratinized squamous epithelium, making it more

difficult for the patient to tolerate the prosthesis.<sup>[5]</sup>

This case report describes prosthodontic management of a pediatric patient who developed a palatal perforation following chemotherapy for acute lymphoblastic leukemia (ALL).

## Case Report

A 6-year-old boy, case of ALL, was referred for prosthetic rehabilitation of a palatal perforation following chemotherapy [Figure 1]. A detailed case history revealed that the patient was diagnosed with B-cell ALL at the age of 5 years and was on consolidation chemotherapy. Palatal biopsy showed hyperplastic ulcerated squamous epithelium admixed with scanty bony bits and necroinflammatory cells with underlying granulation tissue. Ulcer slough contained a few fungal hyphae suggestive of secondary colonization. Noncontrast computerized tomography scan revealed mucosal pansinusitis and rhinitis. Nasal secretion test for fungal identification and susceptibility testing showed the presence of *Candida tropicalis*. On oral examination, a 2 cm × 2 cm perforation was seen on the left side of the hard palate with slough. It was decided to make a palatal obturator to cover the palatal perforation. This defect in the palate led to difficulty in eating, swallowing, and nasal regurgitation. Speech too was hypernasal and not intelligible. It was decided to cover the palatal perforation by fabrication of a palatal obturator.

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A stainless steel stock dentulous tray and irreversible hydrocolloid (Dentalgin; Prime Dental Products, Mumbai, India) were used to record preliminary impression of the maxillary arch [Figure 2]. Mandibular impression was also made with irreversible hydrocolloid. Stone (Kaldent Dental Stone Class III, Kalabhai Karson Pvt. Ltd.) working cast were obtained from the impression. A 19-gauge hard, round, stainless steel orthodontic wire (KC Smith and Co., Monmouth, UK) was used to fabricate the full wire clasp and C clasps for the palatal obturator as shown in figure. A single thickness modeling wax was adapted on the maxillary cast covering entire hard palate and subsequently acrylized into the heat-polymerized acrylic resin (DPI Dentsply, India). The prosthesis was finished and polished in usual manner [Figure 3]. The prosthesis was delivered, and postinsertion instructions were given to the patient regarding hygiene maintenance in the oral cavity [Figure 4]. It was observed that the patient was very comfortable using this removable prosthesis which obturated the palatal defect. This palatal obturator facilitated eating and swallowing. The patient could also comfortably communicate as the speech could be understood by the listeners. The patient was followed up at regular interval. This option of prosthetic obturation of the palatal defect

was preferred over surgical closure in view of the medical history and general condition of the patient.

## Discussion

Leukemia is a malignancy affecting the white blood cells of the bone marrow. Virchow in 1874 described leukemia as “white blood.”<sup>[6]</sup> ALL is more common among children and accounts for 75% of childhood acute leukemia.<sup>[7]</sup>

Palate perforation can occur due to trauma, bacterial infection such as osteomyelitis, Wegener’s granulomatosis, viral infection such as herpes zoster, fungal infection such as mucormycosis, aspergillosis, prolonged cocaine abuse, and malignancies.<sup>[8]</sup>

Palatal perforation is more common in immunocompromised patients as they are more prone to opportunistic infections that may invade the palate and cause palatal perforation.<sup>[9]</sup> This may predispose the patient to hypernasal speech, fluid leakage into the nasal cavity, and impaired masticator function. This severely affects the patient’s quality of life (QOL).

Prosthetic rehabilitation of the palatal perforation with obturator by a maxillofacial prosthodontist has two primary objectives:<sup>[10]</sup>



Figure 1: Intraoral view showing the palatal perforation



Figure 2: Impression of the maxillary arch

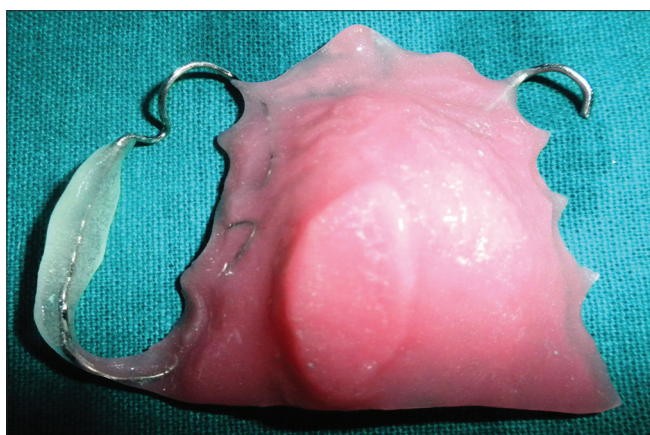


Figure 3: Finished prosthesis



Figure 4: Prosthesis insertion done

1. To optimally restore the functions of mastication, deglutition, and speech thereby improving and enhancing the QOL of these patients
2. To achieve normal oro-facial appearance.<sup>[11]</sup>

Recall for the patient is usually done every 2 weeks due to rapid soft-tissue changes that occur within the defect during organization and healing of the wound.

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#### Conflicts of interest

There are no conflicts of interest.

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