Oral care for people with cystic fibrosis requiring a solid organ transplant

Abstract

This clinical feature outlines the oral concerns that may arise in patients requiring solid organ transplantation as a result of cystic fibrosis. The aim of the feature is to provide recommendations to dental practitioners for the pre-surgery dental health check and post-transplantation dental management of such patients. It also outlines therapeutic management of solid organ transplant patients who may have oral consequences.

Introduction

Despite major advances in the medical, paramedical and pharmacological management of cystic fibrosis, solid organ transplantation remains a viable treatment option for end-stage pulmonary disease. Increasingly, lung transplantation is offering people with cystic fibrosis whose disease has progressed to a critical stage hope of living a longer and healthier life.[1] In 2019, the Irish Donor Network reported a record number of lung transplants, with 38 lung transplants undertaken, compared with 28 in 2018.[2] In Ireland, lung transplantation is carried out in The Mater Misericordiae University Hospital, Dublin.

The oral cavity is host to more than 700 species of bacteria and represents an important entry point for possible infections. Depending on the level of infection and inflammation present in the mouth, swallowing, aspiration, and small injuries to mucous membranes can all trigger bacteraemia. Normally of no concern in healthy individuals, bacteraemia accompanying dental treatment in patients subject to immune suppression could be considered a potential cause of systemic illness. Dental assessment and appropriate treatment is considered in most transplant centres to be a compulsory prerequisite for solid organ transplantation. However, standardised guidelines providing counsel for pre-transplant dental health are deficient for patient and dental practitioner alike.

Pre-transplantation management

Dental practitioners play an important role in the provision of dental care for patients with chronic pulmonary illness and imminent transplantation throughout their lifetime. An emphasis should be placed on regular attendance, preventive therapies and patient education to ensure continuous, stable oral health. A dental infection has the potential to cause a heightened inflammatory response or result in the cancellation or postponement of a lifesaving transplantation procedure.[3] In the absence of standardised guidelines, pre-transplant dental assessment should focus on the identification and elimination of potential sources of infection. Dentists should also be mindful when conducting this assessment that routine dental treatment is not recommended for six months post transplantation because of a heightened state of immunosuppression.[4]

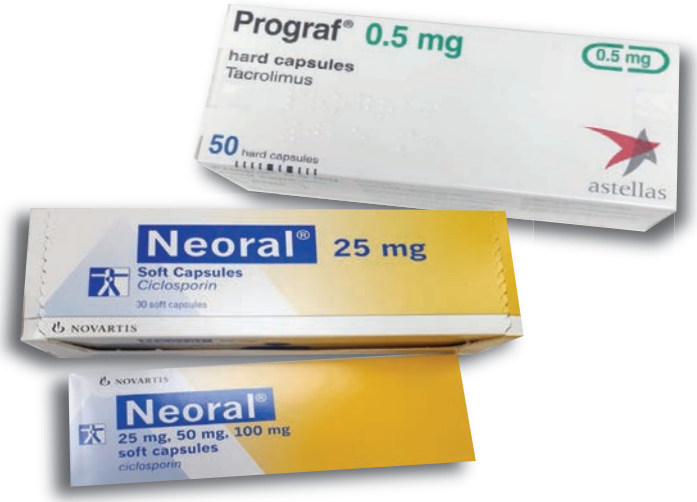

FIGURE 1: Prograf and Neoral are both used for immunosuppression following solid organ transplant.

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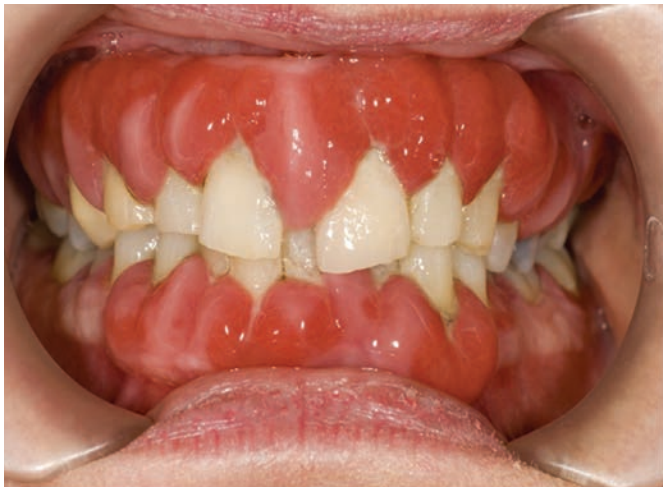

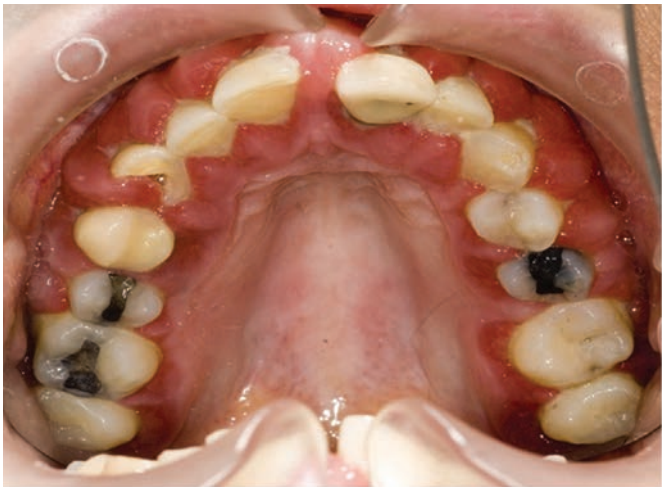

FIGURES 2 and 3: Drug-induced gingival hyperplasia.

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Table 1: Post-transplantation medicine

Immunosuppression phase	Medication	Oral complications
Induction therapy	Basiliximab	White patches in mouth, tongue and throat
	Methylprednisolone	Dry mouth, difficulty swallowing, heartburn
	Valganciclovir	Ulcers, sores, white spots in the mouth
	Caspofungin	Cracked lips, sores, ulcers, white spots on the lips, tongue, oral mucosa
	Ceftazidime	Oral candida
	Flucloxacillin Metronidazole	(Medication may be tailored according to microbiological results from donors and recipients)
Maintenance therapy	Tacrolimus	White patches on tongue, throat and oral mucosa
	Cyclosporin	Gingival hyperplasia, sores, white spots, ulcers on lips and in the mouth
	Mycophenolate mofetil	Dry mouth, bleeding gingiva, sores, ulcers and white spots in the mouth

Table 2: Oral conditions reported post transplant.

Leukoplakia
Erythroplakia
Lichen planus
Glossitis
Xerostomia
Halitosis
Gingival bleeding
Dysgeusia
Basal cell carcinoma
Viral infections (Epstein Barr, herpes virus)
Fungal infections (*Candida albicans*)

When conducting a pre-transplant dental assessment, consideration should be given to:

- the patient's previous dental history;
- medical stability;
- attitude to dental care;
- time constraints; and,
- planned future pharmacological therapies post transplantation, i.e., bisphosphonate therapy.

Post-transplant management

Following transplantation, recipients commit to lifelong immunosuppression therapy to prevent organ rejection (**Figure 1**).

Immediately post transplant, induction therapy provides a high degree of immunosuppression. This is supplemented with antimicrobial agents to provide prophylaxis against bacterial and fungal infections. Subsequent lifelong immunosuppression is provided at lower doses during maintenance therapy (**Table 1**).[5]

Immunosuppressive medications can complicate oral health. Drug-induced gingival hyperplasia (**Figures 2** and **3**) caused by the immunosuppressive drug cyclosporin A is a common complication. This risk is further amplified if a patient is prescribed a calcium channel blocker (e.g., nifedipine), has poor oral hygiene and untreated periodontitis.[6] Oral hygiene and the patient's periodontal health play a decisive role in the level of manifestations of such gingival alterations. Oral hygiene education and non-surgical periodontal treatment play central roles in the management of drug-induced gingival overgrowth.[7]

Long-term immunosuppression increases patient susceptibility to pathological oral conditions (**Table 2**).[8] Immunosuppressive drugs are thought to cause malignancy by a carcinogenic effect or by increasing the carcinogenic effect of other agents combined with an immunosuppressive effect.[9] The importance of regular oral examinations is essential so that any dysplastic or malignant changes can be detected early.

Antibiotic prophylaxis

Finally, the prescription of antibiotic prophylaxis for dental treatment following solid organ transplant is ambiguous and can be a source of

concern for many practitioners. Surveys conducted in transplant centres in the US[10] and Germany[11] both concluded that due to lifelong immunosuppression, antibiotic prophylaxis should be given before dental treatment is undertaken. However, with regard to the type of dental measures (invasive or non-invasive procedures) and the choice of antibiotic, no clear recommendations could be established. Irish Dental Council guidelines state that antibiotic prophylaxis should be given to "cardiac transplantation recipients, who develop cardiac valvulopathy". Consideration should be given to the type of antibiotic prescribed due to the increased risk of antibiotic allergy and multidrug resistance in this population. It is the authors' recommendation that dental practitioners seek clarification from the patient's specialist team in the absence of definitive guidelines.

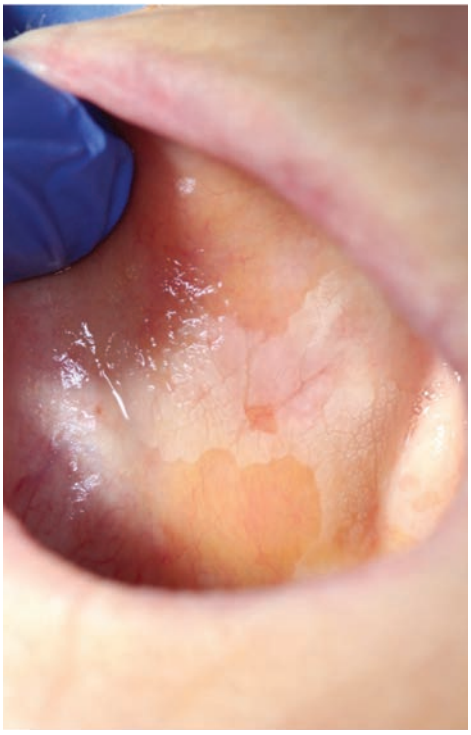

FIGURE 4: Leukoplakia on the buccal mucosa.

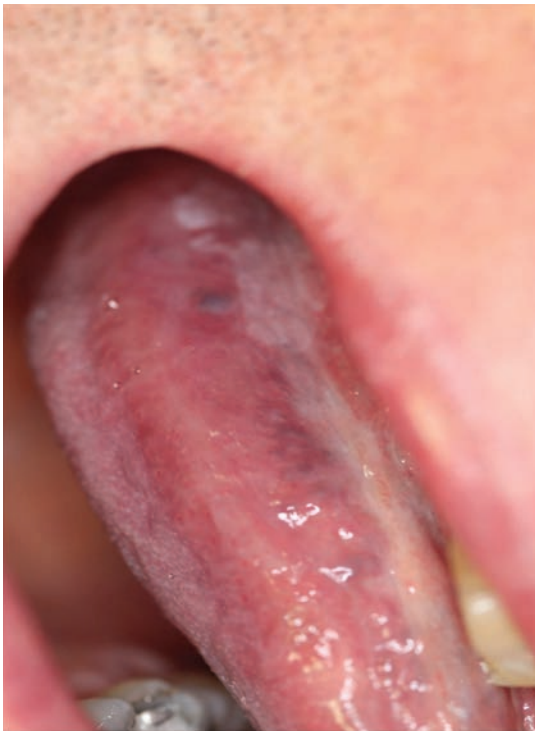

FIGURE 5: Leukoplakia on the lateral border on the tongue.

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Comments

A lifetime commitment to pharmacological therapies can jeopardise oral health and make the provision of dental treatment challenging. Dental practitioners play an important role in the promotion of oral health and in patient education. Continuity of dental care with an emphasis on disease prevention is paramount for patients with chronic pulmonary diseases such as cystic fibrosis that may require solid organ transplantation. Currently, there are no formal guidelines regarding the provision of dental care for this medically vulnerable cohort of patients. The authors hope that with ongoing research in this field formal guidelines will be developed to assist practitioner and patient decisions about appropriate healthcare for these specific clinical circumstances.

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