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Dental care management in children with high risk of Infective Endocarditis: Case report.

Amina Labidi[1,2], Imen Jazi[1], Atika Bouabid[1,2], Manel Chalbi[1], Jihen Zaroui[1], Mohamed Ali Chamli[1,2]

1- Pediatric dentistry and prevention department at Rabta Hospital

2- Research Laboratory : LR12ES10 : Approche Biologique Et Clinique Dento-faciale (ABCDF), University of Monastir, Tunisia

Corresponding author:

Amina Labidi

E-mail address: labidiamina101@gmail.com

Abstract

Introduction

Infective endocarditis (IE) presents a high risk in pediatric patients suffering from a congenital heart disease when proceeding dental acts. Antibiotic prophylaxis (AP) is primordial to avoid IE in individuals with high-risk, mainly before invasive dental procedures.

Observation

Two clinical cases were reported: a 10-year-old girl affected by Down syndrome and a presenting a non-surgically repaired ventricular septal defect, and a 9-year-old girl with Williams-Beuren syndrome, a prosthetic heart valve and allergy to penicillin. These two cited patients were referred to our service (pediatric dental service in Rabta hospital) for oral examination and management. Several decayed teeth were noticed during the clinical and radiographic investigations. These damaged teeth were indicated for extraction, under antibiotic prophylaxis (penicillin for the first patient and macrolide for the second one).

Discussion

The presented clinical cases confirmed how essential it is to treat, as early as possible and with proper AP, pediatric patients with high risk of IE. The recent and updated research proves that the strategic use of AP remarkably decreases the incidence of IE after invasive dental treatments. An interdisciplinary approach between pediatric dentists and cardiologists is crucial to guarantee an effective and proper management.

Keywords:
Antibiotic prophylaxis, Infective endocarditis, Dental Care, Child

Introduction

An infection of the heart's endocardial surface, which may affect the mural endocardium layer, one heart valve or more, or a septal defect, are the main symptoms of infectious endocarditis (IE) [1]. It has been highlighted that oral bacterium that enters the bloodstream, physiologically and particularly during dental procedures, play a significant role in the occurrence of endocarditis [2]. According to recent studies, patients who have a high risk of infective endocarditis (IE) should necessarily get antibiotic prophylaxis (AP) prior to some specific dental treatments, mainly the invasive ones [3].

This article highlighted how essential it is to treat, as early as possible and with proper AP children who are medically followed-up for heart abnormalities placing them in a high-risk of EI.

Observation

Case1:

A 10-year-old female patient affected with trisomy 21, medically followed-up since birth for ventricular septal defect (VSD), was referred to our pediatric dentistry department at La Rabta hospital by the cardiology department in order to ensure a preoperative oral assessment to prepare for an upcoming cardiac surgery.

Several decayed teeth were noticed during the clinical and radiographic investigations (Fig. 1(b), Fig. 1(c)): teeth 55, 74, 75, 83, and 85, that we decided to extract (Fig. 1(d)).

An interdisciplinary coordination with the patient’s treating cardiologist was ensured, who affirmed the necessity of AP before extractions.

Given the patient’s weight, a dose of 1500mg of Amoxicillin was administered orally as antibiotic prophylaxis 1 hour prior to the procedure, respecting the guidelines suggested for IE prevention.

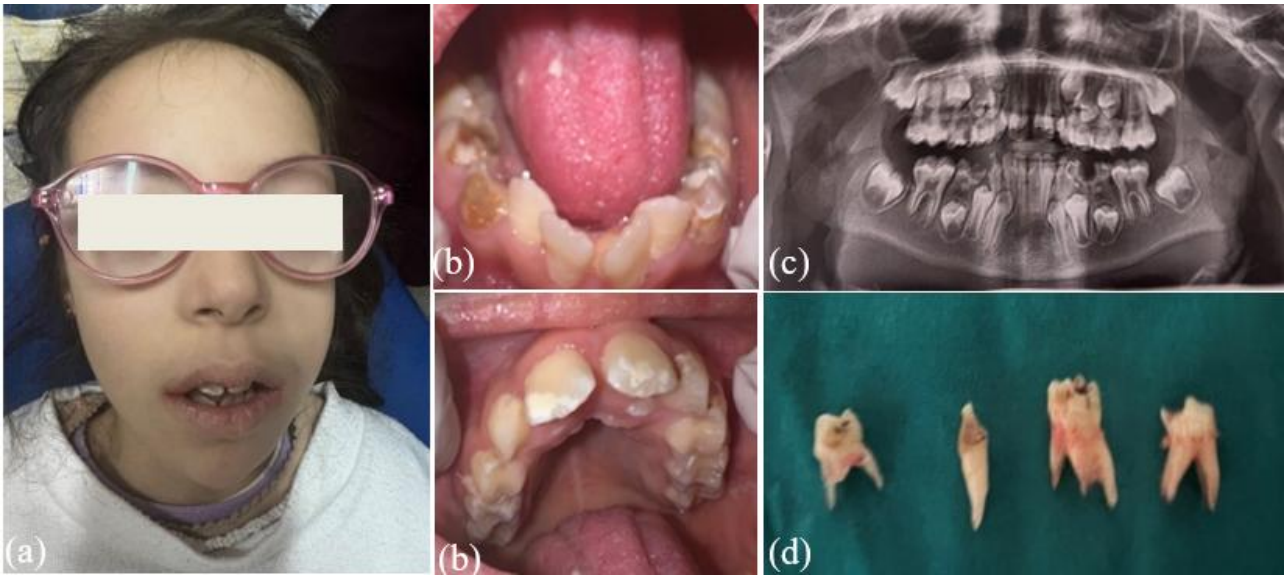

Figure1: (a) Frontal view; (b) Intraoral view: multiple caries on temporary teeth; (c) Panoramic radiograph; (d) Extracted teeth

Case2:

A 9-year-old female patient affected with Williams-Beuren syndrome, known to a have prosthetic heart valve and allergy to penicillin was referred to our pediatric dentistry department at La Rabta hospital by the cardiology department in order to ensure an effective oral management.

Severely carious teeth were noticed during the clinical investigation (Fig. 2(b)) namely teeth 74 and 84 that were dedicated to extraction (Fig. 2(c)).
An interdisciplinary coordination with the patient's treating cardiologist was ensured, who affirmed the necessity of AP before extractions, given she was at high risk of EI.

Given the patient's allergy to penicillin, a dose of 500mg of Azithromycin, administered orally as antibiotic prophylaxis 1 hour prior to the procedure was ensured, respecting the guidelines suggested for IE prevention for patients with beta-lactam allergy.

Figure2 (a)Frontal view; (b)Intraoral view: caries on tooth (74) and (84); (c) Extraction of (74) and (84)

Discussion

When microbial infection occurs in the endocardial surface, it unfortunately causes infectious endocarditis (IE), a very menacing and potentially fatal anomaly that affects one heart valve or more, or causes a septal defect [4]. IE is most likely developed in patients suffering from congenital cardiac anomalies (valve abnormalities or septal defects) especially after bacteremia-inducing procedures such as tooth extractions. Recent guidelines from the European Society of Cardiology (ESC) and the American Heart Association (AHA) highlight the significance of antibiotic prophylaxis (AP) before invasive dental treatments in high-risk people [5,6].

In the two reported cases, both children had congenital heart anomalies: one with Down syndrome (trisomy21) and a ventricular septal defect (VSD), and the other child with Williams-Beuren syndrome and presenting a prosthetic heart valve. These heart conditions make them eligible for antibiotic prophylaxis treatment given that they are at high risk for IE [7]. The first patient had a penicillin-based AP, while the second patient who was allergic to penicillin, received an appropriate alternative, in line with current recommendations [6]: for patients with congenital heart disease and with penicillin allergy, azithromycin is recommended as an alternative to this molecule for AP to prevent infective

endocarditis during dental procedures. For patients with medical history of penicillin allergy, azithromycin, clindamycin, and cephalexin are now recommended by recent and updated American Heart Association (AHA) and European Society of Cardiology (ESC) guidelines [8].

It is proven that oral germs, especially streptococci, can cause IE after dental acts. Through an inflamed or ulcerated oral mucosa, they enter the circulation, and more frequently during extractions or even normal brushing in people with poor oral hygiene [9]. The two patients previously presented had several decayed teeth, judged non-restorable and indicated for extraction, highlighting the significance of preventive oral hygiene and early dental treatments for patients and more specifically children suffering from congenital heart disease. Recent evidence supports the efficacy of AP in reducing IE incidence among high-risk dental patients. In high-risk populations, Sperotto et al.'s systematic review and meta-analysis, published in 2024, showed that AP administration prior to invasive dental procedures reduced IE risk by 59% [10]. Likewise, Bergadà-Pijuan et al. conducted a study in 2023 revealing that AP recipients experienced a 49% decrease in post-procedural bacteremia [11]. These results support the clinical strategy used in the cases previously discussed.

Although the general public should not take AP on a regular basis due to antibiotic resistance and unknown benefits, its selective use in high-risk patients, as demonstrated here, is highly justified [5,6,10].

These instances highlight the significance of incorporating evidence-based antibiotic regimens into clinical treatment for medically difficult pediatric patients and reinforce the responsibility of the dental team in detecting and treating oral infections prior to heart surgeries. [12]

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