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Prosthetic Management for a Palatal Perforation from Cocaine Abuse

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Abstract

The intranasal inhalation of cocaine predisposes the user to a wider range of local and systemic complications. This article describes the history of a 31-year-old woman with a palatal perforation produced by the chronic use of cocaine. In view of the doubts about abstinence from cocaine abuse, prosthetic management was chosen. The obturator comprised a metal framework for dental retention and to prevent displacement and a resin obturator to block the defect. In addition, acrylic resin facilitated adjustments due to the fact that it is easy to adapt to changes in the size of the palatal defect.

The abuse of cocaine has increased worldwide over the last decades. Nasal inhalation of cocaine (snorting) is the most common current method of administration. The euphoric effects appear a few minutes after consumption and last for 90 minutes.[1] Direct contact of inhaled cocaine with nasal mucosa induces local vasoconstriction and irritation due to the effect of both the active substance and adulterants. Repeated snorting sets up a cascade of ischemia, inflammation, micronecrosis, infection, and then macronecrosis leading to perforation. This situation has increased the reports of local and systemic complications.[2] According to Silvestre et al, "A range of midfacial destructive lesions have been documented, including perforation of the nasal septum, destruction of the lateral wall of the nasal cavities, and perforation with necrosis of the soft and hard palate."[3] The various sinonasal structures are destroyed at different frequencies. According to Trimarchi et al[4] nasal turbinates were affected in 68% and palatal perforation was seen in 25% of patients. Management consists of a combination of antibiotics, prostheses (obturators), and surgical reconstructions of the defect, but the treatment can be difficult because of the patients' noncompliant lifestyles. Prosthetic management of palatal defects was necessary to restore speech and swallowing function.

To date, only a few cases of palatal perforation from cocaine inhalation have been reported in the literature and fewer still described the treatment by means of an obturator.[3,5] This clinical report describes the history of a patient with a cocaine-palate perforation and the fabrication of a maxillary obturator for the prosthetic rehabilitation of this defect.

Clinical report

In January 2012, a 31-year-old woman was seen for evaluation in the Department of Prosthodontics at the Faculty of Medicine and Odontology, Santiago de Compostela University, Spain. Her medical record indicated moderate consumption of alcohol and current use of oral antidepressive medication. She reported a 7-year history of abusive cocaine consumption. During this time, she began to experience hypernasal speech, nasal obstruction, anosmia, and a diminished sense of taste. The oronasal fistula developed as a small hole 3 years before presentation at our clinic with regurgitation of both solids and liquids. Surgical reconstruction of the defect had been attempted unsuccessfully a year earlier, with the fistula reopened within months after palatoplastia. General examination was unremarkable except for hypernasal speech, and intraoral examination showed a 1.5×1.5 cm oronasal fistula located in the posterior hard palate (Fig 1). The surrounding areas were nonerythematous with no associated purulence or tenderness. The treatment goal was to

Figure 1 Occlusal view of palatal perforation.

Figure 2 Impression of the defect.

obturate the hard palate defect to restore speech, swallowing, and masticatory function. Surgical repair of the perforation was not attempted at this time because the previous attempt was unsuccessful, and because of the likelihood of continuing drug abuse by the patient.

After basic oral hygiene and restorative procedures were provided, a removable obturator was constructed. The definitive impressions were completed using custom trays (Triad Custom Tray Material; Dentsply Trubyte, York, PA) and washed with polyether impression material (Impregum Soft Quick Step Light Body; 3M ESPE, St Paul, MN; Fig 2). A prosthetic device that comprised a chrome-cobalt alloy framework (Wironium Plus; Bego, Bremen, Germany) and a resin obturator was designed. The wax pattern was invested in phosphate-bonded investment material (Kromco-Vest; Matech, Inc. Sylmar, CA) according to the manufacturer´s instructions using an induction casting machine (Aseg, Galconi, Italy). The casting was carried out after the investment was sufficiently set. The chrome-cobalt framework included a partial palatal connector with occlusal rests between the second premolar and first right molar and first and second right molars, and circumferential clasps around the first and second right molars. The obturator portion was cured in acrylic resin and adjusted in the same way as an acrylic plug to the dimension of the defect, ensuring complete sealing. This allowed normal speech and swallowing (Figs 3 and 4). The

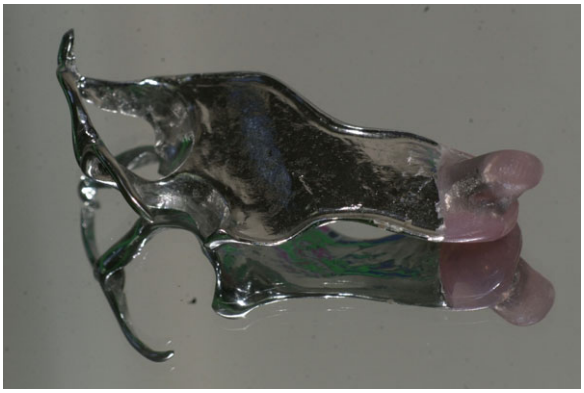

Figure 3 Maxillary obturator, superior surface.

Figure 4 Intraoral view of the maxillary obturator in place.

patient will be reevaluated for possible surgical closure of the oral-nasal fistula at a later date.

Discussion

So far, only a few cases of palatal perforation from cocaine inhalation have been reported in the literature,[6] but oronasal perforations are probably a frequent complication among cocaine abusers. Oronasal perforations happen after the perforation of the nasal septum. Brand et al[7] reported at least 25 cases since 1989. The size is very variable, of 2 mm up to 30 mm, and the majority of the cases involved the hard palate. Only on a few occasions was the perforation limited to the soft palate. Curiously, according to Blanksma and Brand[8] 72% of the patients are female, even though men abuse cocaine more frequently. A recent systematic review of palate perforation in cocaine abusers offers interesting information.[3] Of the 36 patients included in the study, 21 were female and 15 were male. Most of the lesions were located in the hard palate (77.7%), with only 5.5% being found in the soft palate. Combined hard and soft palate presentations in turn accounted for 16.6% of the patients. The mean diameter of the perforation was 19.32 ± 16.94 mm.[3] The most frequent clinical manifestation was rhinolalia together with the regurgitation of solid food and liquids through the nostrils. In a literature search, we found only four references with respect to the prosthetic obturator as alternative treatment.[1,2,5,9]

Villa presented an obturator composed of a cast vitallium frame prosthesis and a bulb for sealing the defect.[5] Marí et al only presented an image of the obturator.[9] Brand et al described a complete palatal defect; the whole obturator was cured in acrylic resin with metal clasps for retention.[1] Hofstede and Jacob reported a cocaine-induced midline destructive lesion treated with an implant-retained maxillary obturator with pharyngeal extension.[2] This information was limited and scarce, and varied due to differences among patients.

Drug counseling and behavior modification to ensure discontinuation of the drug habit before surgical reconstruction are the initial aims of the treatment, and the differential diagnosis must be established with Wegener's granulomatosis, tertiary syphilis, neoplasm, and chronic infection.[1] But the management of these patients is complicated because if the patient continues to consume cocaine, failure in reconstructive surgery is frequent. Oronasal communications have been traditionally rehabilitated using prosthetic obturators. In these cases, obturators restore the continuity and function of the palate and they allow management of speech and eating.[7]

In case of wide or complete palatal defects, a dental-retained obturator is the usual procedure. In the current patient the selection of a Co-Cr alloy was due to biocompatibility; the patient reported a Ni allergy. In small diameter palatal perforations, obturators without dental retention have been reported.[9] In these patients, a unilateral RPD design can be useful to retain the obturator. In case of wide defects, a unilateral design can be slightly retentive, and a bilateral design may be indicated. This approach involves risk of penetration of the device in the nose and sinuses. In addition, another aspect to consider is the scant cooperativeness of these patients because of their noncompliant lifestyle. Many are lost to follow-up. As noted in Silvestre et al's systematic review, "If the patient continues to consume cocaine, necrosis at the margins of the defect would cause the latter to grow, resulting in defective fitting of the perforation.[9] As a result, continuous modifications of the acrylic material would be required."[3]

Conclusion

The designed obturator represents a simple and effective way of managing a palatal defect. Dental retention prevents the penetration into sinonasal cavities, and acrylic resin is easy to adapt to changes in the size of the palatal defect.

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