

CASE REPORT

Persistent Hiccup Reflex Activation for Two Days as a Complication of Dental Implant Surgery: A Case Report

Dr. Luiz Eduardo Imbelloni

Instituto Nacional de Câncer (INCA) Senior Researcher, Rio de Janeiro, RJ, Brazil.

Co-responsible for CET-SBA-MEC, Anesthesiologist Hospital Clínicas Municipal de São Bernardo do Campo, São Paulo, SP, Brazil.

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Corresponding Author: Dr. Luiz Eduardo Imbelloni, Av. Epitácio Pessoa, 2356/203 - Lagoa 22411-072 - Rio de Janeiro, RJ - Brazil.

Abstract

Background: Hiccups are the sudden involuntary contractions of the diaphragm and intercostal muscles. Although it is usually a temporary situation, hiccups that do not respond to drugs may be adopted in terms of sleep, intake, or verbal communication. Here, we report a case of a persistent hiccup that has been temporally associated with dental implant insertion and use of dexamethasone.

Case Report: A 77-year-old man was admitted for the 3rd implant attempt in tooth 35. Unlike the other two attempts, in addition to the antibiotic, dexamethasone was added before surgery. The hiccups started after second dose of dexamethasone. Initially, the patient made several attempts to stop the hiccups with various tricks described in the medical literature. Dexamethasone and antibiotics were discontinued and several medications were administered, with the hiccup remaining for two days.

Conclusion: Although hiccups are not life-threatening, it should not be neglected since it can be severely uncomfortable and significantly diminish the quality of the postoperative period, even in dental implants. Dexamethasone is used as an antiemetic, but it can cause persistent hiccups.

Keywords: Corticosteroids, Dexamethasone, Hiccups, Neurotransmitters, Antibiotics, and Dental Implants.

Key Points

What is already known?

- Steroids have been widely used in patients when severe inflammation needs to be rapidly attenuated.
- Steroids may cause adverse effects.
- Dexamethasone has been occasionally reported as causing hiccups in cancer patients.
- The classification of hiccups is based on their duration.
- Several central neurotransmitters are implicated in hiccups.

- The hiccups are generated by a reflex arc with afferent, central, and efferent components.
- There are reports of hiccups after dental implants using dexamethasone.

What this article adds.

- Three implants were performed only with antibiotic prevention.
- Due to the loss of the implant in tooth 35, a new attempt was made with dexamethasone associated with the antibiotic.
- Two 8 mg doses of dexamethasone were administered, and hiccups occurred after the second dose.

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- Several tricks are taught to relieve hiccups, without success.
- Various medications have been used without success in the cessation of hiccups.
- Both dexamethasone and the antibiotic were immediately discontinued.
- The hiccup lasted nearly two days.
- In this case, it seems that the cause of the hiccup was the administration of dexamethasone.

1. Introduction

Since Hippocrates, hiccups had already been described. Hiccups are experienced by all people to different degrees [1]. The classification of hiccups is based on their duration. An acute attack lasts less than forty-eight hours. Persistent hiccups last more than two days. Intractable hiccups are present if the attack lasts more than one month [1]. Hiccups can sometimes be amusing especially in all patients because they are involuntary and they produce a strange sound, which is caused when the diaphragm starts contracting involuntarily. It is widely accepted that hiccups are generated by a ‘reflex arc’ with afferent, central, and efferent components [2]. The central neurotransmitters implicated in hiccups include GABA, dopamine, and serotonin, while the peripheral neurotransmitters are epinephrine, norepinephrine, acetylcholine, and histamine [3].

A case of a hiccup after the implantation from the third attempt of tooth 35 will be reported after two previous attempts were lost.

2. Case Report

The protocol ACERTO was registered in Brazil platform (CAAE: 09091312.1.0000.5179), to study the abbreviation of fasting and perioperative conducts in elderly patients. The Ethics Research Committee approved the study protocol (Number: 171.924). I obtained informed consent and discussed it the anesthetic technique and behavior of the dentist regarding the new implant with the patient. In 2015 and 2017, teeth 46 and 47 were implanted, with the same procedure without implant loss or use of dexamethasone (Figure 1).

After losing two previous implants, a 77-year-old man, 80 kg, and 174 cm was selected for the 3rd implant attempt in tooth 35, performed in the space between teeth 35 and 36, and bone loss in this region (Table I, Figure 2). His past medical history was arterial hypertension controlled with valsartan (160 mg),

hydrochlorothiazide (12.5 mg), and anlodipine (5 mg), with normal ECG. An exercise test was performed 3 months ago and it was normal. He has been using hydroxyzine hydrochloride (25 mg) 3 times a week to control cutaneous dermographism for some years, rosuvastatin calcium (20 mg), and somalgin cardio (81 mg) for three months. With activity 6 times a week of walking 8 km. Other blood tests were normal and no history of bleeding. Recent US examination of the total abdomen, no changes were found.



Figure 1. Computed tomography showing the implants in teeth 46 and 47, and the presence of an implant in tooth 36.

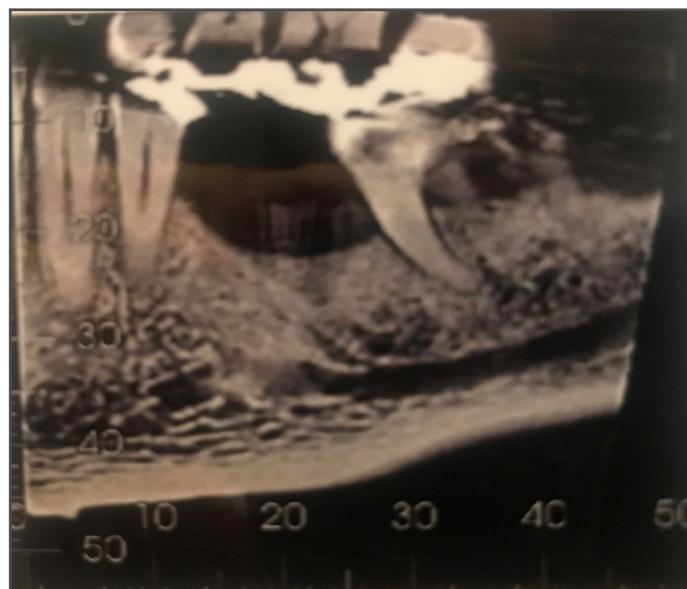


Figure 2. Computed tomography showing absence of teeth 36 and 37 and bone loss in this region.

The two implants were performed in 2015 (tooth 46) and 2017 (tooth 47) without any problems (Table I). The two attempts with losses and the last procedure are well described, showing that there were no hiccups. The patient had taken a prophylactic dose of 8 mg oral dexamethasone associated with 500 mg of amoxicillin approximately 2 hours earlier, with oral supplementation of 200 ml (Fresubin®). After implantation in the space between teeth 35 and 36, the patient was released for residency (Figure 3).

The patient was discharged under antibiotic therapy (amoxicillin 500 mg 8/8 hours for 5 days), a second dose of 8 mg of dexamethasone the morning after the procedure, and oral dipyron at a dose of 40 mg/

kg every 6 hours. Practically 1 hour after the second dose of dexamethasone, hiccup abruptly presented and failed to cease.

Table 1. Various dental implant and operative conduct.

Date	Tooth	Antibiotic	Postoperative	Implant loss
06/15/2015	46	Clavulin® 875/120 mg	Maxsulide 400 mg	NO
02/20/2017	47	Clavulin®875/120 mg	Maxsulide 400 mg	NO
10/22/2021	36	Azitromicina 500 mg/day	Ketorolac 10 g 6/6 h	YES
06/10/2022	36	Azitromicina 500 mg/day	Ketorolac 10 g 6/6 h	YES
02/10/2023	35-36 Space	Amoxicillin 500 mg 8/8 h Dexametasona 8 mg - 2 dosis	Dypirone 40 mg/kg 6/6 h Various medications	Hiccup

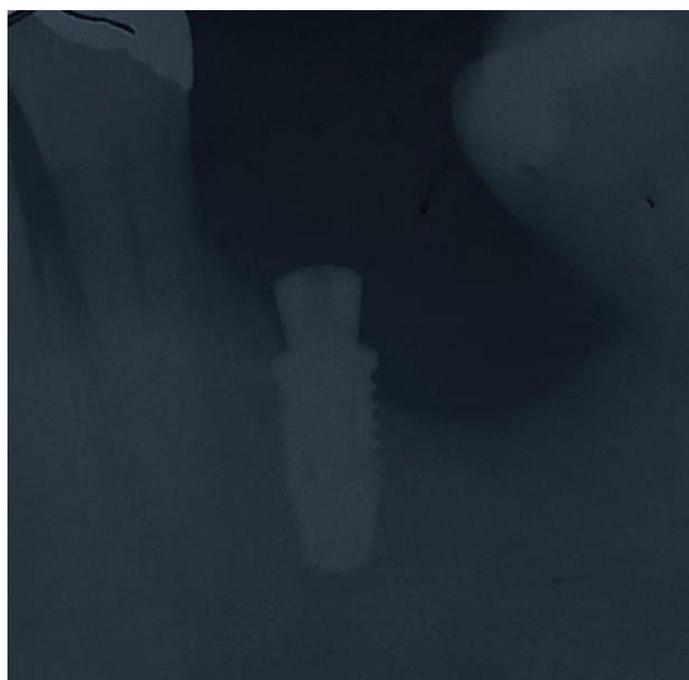


Figure 3. A Dental implant placed in the space of teeth 35 and 36.

Initially, the patient made several attempts to stop the hiccups with various tricks described in the medical literature, and virtually none stopped the hiccups. After the episodes of hiccups worsened, dexamethasone and antibiotics were discontinued, and sodium bicarbonate powder (10 ml), hydroxyzine hydrochloride (25 mg), pantoprazole (40 mg), and metoclopramide (10 mg) were administered orally, a second dose of medication is given 12 hours later. No improvement occurred.

The frequency of the hiccups decreased a lot after 20 hours of its appearance, remaining a few times every hour. The patient’s hiccups resolved completely by second day after he took the dexamethasone. At the 1-week postoperative appointment, the incident was reviewed with the patient, and counseling was given on the suspected drug-induced cause of the transient hiccups for his future reference/benefit.

3. Discussion

The hiccups were diagnosed as acute and temporary (two days) they may be triggered by fear or stress (3rd attempt), use of alcohol (a glass of wine), and spicy foods may irritate the diaphragm. The only difference between the implant performed 8 and 6 years ago in teeth 46 and 47, antibiotic prophylaxis with an association containing 875 mg of amoxicillin and 125 mg of clavulanic acid-coated tablets, and analgesia postoperative with nimesulide in complex with beta cyclodextrin (400 mg). In the two attempts to perform the implant in tooth 35, amoxicillin 500 mg 8/8 h and the inclusion of dexamethasone in this procedure were part of the conduct from the dentist. In both attempts, was administered as an antibiotic, in the same way as in tooth implant number.

Different steroids have been implicated as causes of hiccups. With the use of dexamethasone, hiccups have been described when administered orally, intramuscularly, and intravenously [4]. Numerous pharmacologic agents have been associated with hiccups including steroids [5]. As several neurotransmitters (NE) are related to the onset of hiccups, antagonists of these NE can be used as a treatment, such as GABA, dopamine, 5HT serotonin, histamine, epinephrine, and acetylcholine blockers[3].

Although discontinuation of therapy may be sufficient, patients occasionally require pharmacology intervention. Hiccups occurred during each course of dexamethasone therapy began 12 hours after first dose and immediately after the second dose of dexamethasone, continuing for up to 20 hours. With improvement at the end and sporadic return the next day after suspension and treatment with some medications.

Dexamethasone, an essential antiemetic for chemotherapy, may cause hiccups, and

dexamethasone-induced hiccup happens frequently, its discontinuance and the possible replacement of dexamethasone with methylprednisolone is a conduct to be performed [6]. The hiccups started after each patient received a single dose of dexamethasone. The frequency and severity of their hiccups increased over time during dexamethasone treatment.

If no specific pathology has been identified, or no definitive treatment is possible, then a range of empirical medical treatments have been described for the treatment of hiccups. Several tricks are taught to relieve hiccups, such as: drinking a glass of ice water, or sucking on ice; putting a cold compress on your face; holding your breath; drinking some water with the torso inclined; covering your nose and forcing to exhale; eat a spoonful of sugar, honey, lemon, ginger. This fact occurred in the present case, as some of these treatments were unsuccessful, demonstrating their ineffectiveness when the hiccups were generated by the use of dexamethasone.

More than 100 causes of persistent or intractable hiccups have been identified, including infection, trauma, tumor, and a myriad of gastrointestinal, metabolic, and psychogenic disorders [7]. In contrast, brief bouts of hiccups associated with anesthesia practice are more often precipitated by anesthetic medications or gastric distention from swallowing blood and debris

Triggers for hiccups are conventionally described as central or peripheral in origin. More often the origin of the triggering stimulus occurs peripherally in epigastric locations following gastric distention, irritation, or reflux [7]. This would explain its occurrence following dental surgery, particularly in cases of excess swallowing of blood and debris. However, more familiar culprits to the dentist include steroids, benzodiazepines, opioids, barbiturates, phenothiazines, antibiotics, and alcohol [8].

Pharmacological intervention can be considered if hiccups continue for longer than an hour or two, despite attempts with innocuous remedies. Many drug classes have been suggested in the scientific literature, each having distinctly different actions, but none of these have unequivocal efficacy. In the present case, four medications were used, but the withdrawal of dexamethasone was the factor that improved the symptoms.

Due to the far-reaching reflex arc and a myriad of neurotransmitters involved, there are many causes of intractable hiccups. A recent systematic review

revealed a wide range of pharmacological treatments has been used to terminate persistent and intractable hiccups such as metoclopramide, baclofen, omeprazole, gabapentin, chlorpromazine, and valproic acid, revealing their levels of evidence [9]. In the present case, sodium bicarbonate, hydroxyzine, pantoprazole, and metoclopramide were used every 12 hours. There is a lack of good-quality evidence to recommend specific treatments for hiccups [1].

4. Conclusion

Hiccups are a common and frequently transient nuisance. There are many uses for steroids in medicine and dentistry, and clinicians should be attentive to any possible side effects of medications prescribed. Although having hiccups is a common experience, the exact pathophysiologic mechanism and functional significance of hiccups remain a medical enigma. Two doses of dexamethasone were considered to trigger hiccups for two days. This paper and case explain the correlation between hiccups and steroid treatment in the perioperative setting. Fortunately, most cases of corticosteroid-related hiccups appear to be transient and usually end after the drug is withdrawn, the fact that this happened, was associated with the treatment performed with drugs. Finally, the author of the case report was the patient himself, having not observed this complication during 49 years as an anesthesiologist with the use of dexamethasone to prevent nausea and vomiting.

5. References

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