

Dental Caries Possibly Triggered by Isotretinoin Therapy: Case Report

Muhtemelen İzotretinoin Tedavisi Sonrası Gelişen Diş Çürükleri

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ABSTRACT Isotretinoin is used for treatment of nodular cystic acne unresponsive to conventional therapy. Since isotretinoin use has increased in all over the world, physicians are more likely to encounter its side effects. Most adverse effects are dose dependent, mild and predictable. They can easily managed by the patient. There is little documented evidence of the isotretinoin therapy on the dental side effects. We present oral side effects of isotretinoin treatment in a 18-year-old female patient with respect to salivary flow, buffer capacity, counts of pathogen bacteria who developed dental caries during this treatment. Isotretinoin use may be associated dental caries. Before isotretinoin therapy is initiated, clinicians need to be aware of the oral side effects. Risky patients can receive dental care programme in order to prevent accelerated caries development during this therapy.

Key Words: Acne vulgaris; isotretinoin; dental caries; saliva

ÖZET İzotretinoin geleneksel tedavilere cevap vermeyen nodüloistik aknelerin tedavisinde kullanılmaktadır. Tüm dünyada izotretinoin kullanımında artış olmakla birlikte, hekimler de daha sık ilacın yan etkisiyle karşılaşmaktadır. Çoğu yan etkiler doza bağlıdır, hafiftir ve önceden tahmin edilebilir. Hasta bu yan etkileri kendi önlemleri ile azaltabilir. İzotretinoin tedavisinin dişle ilgili yan etkisini bildiren çok az bildiri vardır. Bu yazıda izotretinoin tedavisi sırasında diş çürükleri gelişen 18 yaşındaki kadın hastada ilacın tükürük akış hızı, tamponlama kapasitesi, patojen bakteri sayısı ile ilgili ağız mukozasındaki yan etkileri sunulmuştur. İzotretinoinin kullanımı diş çürükleri ile ilişkili olabilir. İzotretinoin tedavisi başlanmadan önce klinisyenlerin ağız mukozası ilgili yan etkilerinin farkında olmaları gerekir. Riskli hastalar tedavi süresince diş çürüklerinin ilerlemesini engellemek için diş bakımı programı alabilirler.

Anahtar Kelimeler: Akne vulgaris; izotretinoin; diş çürükleri; tükürük

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Isotretinoin is one of the most effective therapeutic agents for acne with long-term remission rate. Patients treated with this drug may expect some complications. Most adverse effects are dose dependent, mild and predictable. They can be easily managed by the patient. Isotretinoin treatment may also facilitate the occurrence of the disease in people who are predisposed to that disease.

Dental caries is characterized by the progressive demineralization of the tooth, following the action of bacterial acid metabolism. Insufficient amounts of saliva may cause dental caries. Protection of the oral cavity de-

depends on a needed sufficient amount of saliva. Medications altering of the salivary flow have been recognized as a risk factor for dental caries.¹ However, there is little documented evidence of the isotretinoin therapy on the dental side effects.² Therefore, in this case report we aimed to present oral side effects of isotretinoin treatment in a young adult patient with respect to salivary flow, buffer capacity, counts of pathogen bacteria who developed dental caries during this treatment.

CASE REPORT

A 18-year-old female had severe acne primarily on her face. Numerous prior antibiotic courses had provided minimal improvement and she had no concurrent medications. The patient had no other significant medical problems except some initially detected active caries (teeth numbers; 44, 45, 36 with approximal caries lesions). She was started on oral isotretinoin at a dose of 0.5 mg/kg/day for six months therapy. Appropriate laboratory tests-including complete blood cell counts, lipid levels, and liver function tests-were performed at baseline and at regular intervals.

A dentist performed the intra-oral dental exam with a dental mirror and a probe under operating dental lamp at baseline and at the end of the therapy. Radiographic diagnosis (Figure 1) and also microbiological caries activity tests including salivary flow, buffer capacity and counts of pathogen bacteria (*St. Mutans*, *Lactobacillus*) were evaluated at the baseline and at the end of isotretinoin therapy by the same dentist. During this evaluation, the patient was advised for the dietary habits and oral hygiene care. Salivary tests were conducted using



FIGURE 1: Radiographic evaluation of the patient before isotretinoin therapy (The arrows shows the initially detected caries lesions).

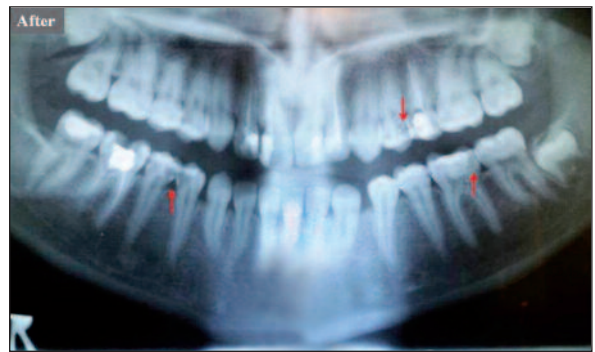


FIGURE 2: Radiographic evaluation of the patient after isotretinoin therapy (The arrows indicate the progressed caries lesions).

whole stimulated saliva samples obtained from patient by chewing a piece of gum during 5 minutes and spitting into a small graduated tube, and then flow rate was measured. Saliva buffer capacity was assessed using a hand-held pH meter. At the beginning of the isotretinoin therapy salivary flow was 1 ml/min, whereas at the end of the therapy it was reduced to 0.7 ml/min, and 2 months after the end of treatment it was changed to baseline values (1 ml/min). At baseline the buffer capacity was 6.5, whereas, it was reduced to 5.5, at the termination of treatment. Two months after end of therapy, buffer capacity was changed to 6. When pathogen bacteria counts were evaluated, *St. mutans* and *Lactobacillus* counts were not changed. During isotretinoin therapy, current caries cavities were progressed (Figure 2) and she had two newly developed initial caries lesions (white spots) on her 37 and 35 teeth as verified by intraoral examinations. All cavitated lesions were treated with a microhybrid resin composite (Filtek Z550; 3M ESPE, St Paul, MN, USA) in conjunction with a total-etching dentin adhesive (Adper Single Bond 2; 3M ESPE).

DISCUSSION

Isotretinoin, a synthetic oral retinoid that is used against severe nodulocystic acne, has been associated with various side effects. Mucocutaneous effects including cracked lips, dryness of the skin and nose, redness of the skin, eye irritation and deterioration of the acne are the most common side effects.

Dental caries is a complex and a lot of factors influence the progression of disease. The physico-chemical properties of saliva like pH, buffering capacity, salivary flow rate, concentration of various components like proteins, calcium and antioxidant defense system play a major role in the development of caries.³

Saliva plays an important role in maintaining a healthy mouth. Studies have demonstrated that patients suffering from low saliva flow rates are susceptible to increased dental caries,^{4,5} and decreased salivary flow most commonly occurs as an adverse effect of medications, and retinoids are known to cause salivary flow and dryness of oral and lip mucosa.⁶ It has been reported that the “cut-off value for a very low stimulated saliva flow rate has to be ≤ 0.7 ml/min”^{7,8} and in our patient it was observed that the salivary flow rate was significantly reduced from 1ml/min to 0.7 ml/min over the course of the therapy which was normalized two months after therapy (1 ml/min). In accordance with our findings, in their clinical study Lupi-Pégurier et al.² has been reported that DMFT (number of decayed, missing and filled teeth) of the treated groups were significantly increased and salivary flow was gradually decreased when compared to control groups over the course of the study. Drugs with anticholinergics or sympathomimetic effects are most commonly associated with xerostomia. Drug-induced dry mouth can triple an individual’s risk of tooth decay.⁹ Our patient did not take any other medicines during isotretinoin treatment.

Saliva has antibacterial and buffering activity, which keeps oral pH neutral; and mechanical removal of residual food particles from the teeth. However, in a dry mouth, the natural buffering capacity is lost and the mouth becomes more acidic. As the pH falls below 5.5, demineralization occurs and this predisposes it to acid-producing bacteria.¹⁰ St. mutans and Lactobacillus are acidogenic bacteria that are major contributors to the formation of dental caries. The levels of these bacteria are higher in patients with hyposalivation.¹¹ However, this finding was not observed in our patient in whom St. mutans and Lactobacillus counts were not

changed at the end of therapy when compared to baseline. Moreover, buffer capacity of the saliva decreased from 6.5 to 5.5 at the end of treatment and this could be a reason for the current caries cavities to progress, and occurrence of two newly developed caries lesions (white-spots) on her 37 and 35 teeth. Two months after termination of therapy the buffer capacity was changed to 6.

The development of caries on the tooth surface is associated with the composition and quantity of dental plaque, diet, the composition and flow of saliva, and exposure to fluoride. Maintaining a low-sugar diet is an effective way to decrease the number of acid-producing bacteria. Controlling the consumption of sugar remains a justifiable part of caries prevention chewing sugar-free chewing gum, used immediately after meals, reduces caries. It is necessary to advice risky patients limiting soft drinks intake and choosing the low erosive soft drinks. Rinsing with a fluoride-containing mouth rinse also appears to prevent dental caries. Additional fluoride appears to be a preventive and therapeutic treatment for dental caries.¹² Because of dental caries at the beginning of the isotretinoin treatment and poor oral hygiene, our patient was regularly followed up. Before the isotretinoin therapy, detected caries teeth of the patients were not treated with restorative materials because of the change of oral microflora especially for the St. mutans and Lactobacillus counts. Additionally, the authors aimed to determine the oral side effects of the therapy and the patients who indicated to use this drug generally do not consult or recommend by physicians during the therapy for the routine oral health care or professional dental visits. Therefore, during isotretinoin therapy, reducing soft drink intake, using fluoride toothpaste to brush the teeth at least twice a day and use of a fluoridated mouthrinse was recommended by the dentist. Although before the isotretinoin therapy all the oral hygiene care and dietary information was advised to the patient, initially existing caries lesions has been progressed by the end of the study. This could be due to during the isotretinoin therapy, salivary flow rate and buffer capacity was reduced and the patient with high caries risk as in this case, should be considered

as being higher risk for future dental caries during isotretinoin therapy as previously reported.²

Past caries experience is one of the best predictors of future caries. Before isotretinoin therapy is initiated, the dermatologists should be aware of potential adverse effects related to its use. Risky younger patients can receive dental care pro-

gramme in terms of oral hygiene instructions, professional oral hygiene regimens, fluoride treatment, dietary supervision and frequent dental follow-up visits in order to prevent accelerated caries development during isotretinoin therapy. We have been conducting a prospective study to reveal the causal relationship between isotretinoin and dental caries.

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