Subcutaneous Emphysema as a Rare Complication Dental Implant Treatment: Case Report

Dental İmplant Tedavisinin Nadir Bir Komplikasyonu Olarak Subkutanöz Amfizem

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ABSTRACT Subcutaneous emphysema is a complication which is seen rarely in dental treatment and it exists due to the using of high pressure air syringe. The emphysema phenomenon related to dental treatments are generally contained local and medium-sized swelling; therefore, usually, they can not be defined or misdiagnosed. Majority of cases with this complication are recover spontaneously after 3 to 10 days. However, consultation with a physician is necessary to rule out the further complications. A case of subcutaneous emphysema during prosthetic treatment procedure of dental implant in a 41-year-old woman was treated in the Department of Periodontology, Faculty of Dentistry, Ataturk University is presented and the differential diagnosis and management of this condition is discussed in this case report. Our purpose is not to add one more case of emphysema to literature but to show that dentists may cause to this complication using air pressure tools in dental implant procedure during.

Key Words: Subcutaneous emphysema; dental implants; air pressure

ÖZET Subkutan amfizem, dental tedavilerde nispeten nadir görülen bir komplikasyon olmakla birlikte; sıklıkla yüksek basınçlı hava şırıngalarının kullanımı ile oluşur. Dental tedaviler ile ilgili amfizemler, genellikle yerel ve orta boyutta şişlik ile sınırlıdır. Bu nedenle, birçok durumda tanımlanamaz ya da yanlış teşhis edilirler. Bu komplikasyona sahip vakaların çoğunluğu 3 ila 10 gün sonra kendiliğinden düzelir. Ancak, bir uzmanla konsültasyon ileri komplikasyonları ekarte etmek için gereklidir. Bu olgu raporunda Atatürk Üniversitesi Diş Hekimliği Fakültesi Periodontoloji Anabilim Dalında tedavi edilen 41 yaşındaki kadın hastada, dental implantın protetik tedavisi sırasında gelişen subkutanöz amfizem vakası sunulmakta ve bu durumun ayırıcı tanısı ile tedavisi tartışılmaktır. Amacımız literatüre bir amfizem vakası daha eklemek değil; diş hekimlerinin rutin dental implant prosedürlerinde hava basıncı araçlarını kullanmaları sırasında bu komplikasyonu oluşturabileceklerini göstermektir.

Anahtar Kelimeler: Subkutan amfizem; diş implantları; hava basıncı

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The emphysema is defined as a medical condition where there is an abnormal accumulation of air in tissues and or part.[1] Subcutaneous emphysema occurs when air gets into tissues under the skin or mucosa. Subcutaneous emphysema in dentistry appears with the use of high pressure air during dental and oral surgery, operative, endodontic or periodontal treatment.[2-4] Subcutaneous emphysema occurs with or without crepitus, pain and airway obstruction. Treatment usually consists of an antibiotic and mild analgesic therapy, close observation and reassurance by the attending dentist.[5]

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Our purpose is not to add one more case of subcutaneous emphysema to literature, but to show dentists that in routine implant restorative procedures using high pressure air instruments. However, specific recommendations as to how to avoid such situations and the prompt recognition and management of this condition are also discussed.

CASE REPORT

Our patient was 41-year-old woman with no clinical history of interest. Dental implants of our case were made six months ago in Department of Periodontology, Atatürk University. Patient was informed and consent form was signed. She was admitted to our clinic again to make the implant prosthesis. First, clinical examination was performed to our patient. The top of the implants in the right mandibular region was found to be covered with gum. We want to remove the gum which is on the implant healing cap. Thus, anesthesia (2% ultracain with articaina hydrochloride+epinephrine hydrochloride) was administered to the inferior alveolar block about half an hour before the incident. The gingival incision was made on the healing cap of dental implant and the gum was curettaged by titanium Gracey's curettes. Healing cap was removed and an abutment was placed. The region was dried to see better by high pressure air syringe horizontally (Figure 1).

The air bubbles were suddenly occurred the exit from the edge of dental implants and a strange vestibule volume increase, which decreased when pressed (Figure 2). In our patient, an immediate swelling was observed of the right upper and lower cheek and right lower left eyelid, accompanied by audible and palpable crepitus. It was found to be asymptomatic (Figure 3). Due to this situation an exhaustive intra and extra oral examination was performed, and expansion of the right jaw region up to the neck was noticed. No increase of temperature or rigidity of the tissue was observed, but the presence of crackling was evident. The patient presented only a slight discomfort, but was painless and had no difficulties to swallow or breathe. However, consultation with a physician was done in order to avoid a rule out further complications

FIGURE 1: Drying with high pressure air for examining the environment of abutment and suddenly the formation of air bubbles indicated by the arrow.

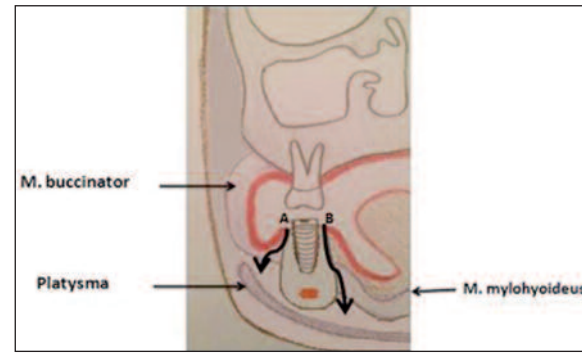

FIGURE 2: Progression of the air dissecting the tissues in our patient. a) Toward the lower cheek and palpebral region b)Toward the cervical region.

FIGURE 3: Subcutaneous emphysema in area of right cheek.

later. Then, she was advised to continue the prophylactic antibiotics treatment with ciprofloxacin that she was already taking and prescribed her an analgesic therapy with Naproxen of 550 mg., BID for three days. The next day, crackling and swelling persistence was evident, but not infection signs. Seven days after, the swelling was solved and crackling disappeared in the neck tissue and the patient was asymptomatic.

DISCUSSION

Subcutaneous emphysema is one of the potential complications of dental practices. A rare case with subcutaneous emphysema, which arose due to use an air syringe to dry of the gingival around cap of dental implant in the lower jaw, was presented.

The thickness of attached gingival, which averages 1.25mm±0.42mm, has an important role in the way in which air progress. If this thickness is getting less, air can easily pass to subcutaneous tissue. In this case, thickness of attached gingival was 1.50 mm. The thickness was sufficient but emphysema occurred.

The distance between the neck of the implant with the syringe was 0.5 millimeter and the air syringe was applied horizontally in 5 seconds, then suddenly the air emphysema was developed. Actually, vertical application has a lot of risk for occurred emphysema, but in this case, the air syringe was applied horizontally. Also, the distance between neck of the implant and syringe wasn't too close, and application time wasn't too long, despite all these, the formation of emphysema may associated with air pressure.

The marginal tissue of neck of the implant might healthy before the insertion of abutment. If this marginal tissue is not healthy, over the time perimplantitise may occur and unhealthy marginal epithelium may easily separated under tissue. In our case, the marginal tissue was healthy and there wasn't any signs of infections.

The differential diagnosis between the subcutaneous emphysema and the situations like hematoma, allergic reaction, soft tissue infections, angioedema which is produced by volume increase is important.[6-8] The angioedema, caused by the use of non-steroidal anti inflammatory drugs or local anesthetics administered in the dental treatment, is the most important.[9]

In order to get correct diagnosis, a detailed history of the fact is crucial, as well as a meticulous palpation of the involved tissue. Crackling is the most important sign that makes the difference from other pathologies.[6,7,10-12] In most cases this sign is detected immediately, nevertheless there are reports in which it may appear subsequently, making diagnosis difficult.

Subcutaneous emphysema occurs with or without crepitus, pain and airway obstruction. The pain can happen with the subcutaneous emphysema when it causes tension in the involved tissues upper and lower cheek and lower right eyelid.[11] There was tension due to swelling without any pain in our case.

Due to the fact that facial planes are contiguous to those of the neck and thorax, is possible that mediastinal emphysema appears. This results from the entry of a large quantity of air to the deepest planes of the neck, passing directly to the top part and then to the anterior of the mediastine.[13] The presence of pain both in the thorax and in the back, would suggest the presence of this type of emphysema.[14,15] In our case, the patient presented only a slight discomfort, but was painless and had no difficulties to swallow or breathe.

The dentist should be take precautions when using air pressure instruments near the gingival margins, especially when the gum is slightly adhered, since a thin entry door is suitable to cause this phenomenon.[10] In our patient, we believed that the air entry took place in the attaching between dental implant neck and gingival. In fact, air bubbles were observed.

Although infection is not usually observed in subcutaneous emphysema, cases have appeared where this condition has developed. For this reason, the use of a prophylactic antibiotic therapy is recommended.[10] Also, our patient was advised to

continue the prophylactic antibiotics treatment with ciprofloxacin and recovered completely after three days.

Most cases of subcutaneous emphysema start resolution after 2 to 3 days, and they are completely overcome after 5 to 10 days.[10,14] In our case, the subcutaneous emphysema was solved after seven days and crackling disappeared in the neck tissue and the patient was asymptomatic. However, we've been advised our patient that she should avoid increase the intraoral pressure, such as blowing the nose vigorously or playing musical instruments, which could introduce more air. It is important to register all procedure in the clinical card and to inform appropriately this condition to the patient. Thus, the clinical card containing our all procedures were filled and given to our patient.

Dentists should be aware that soft tissue emphysema can cause acute swelling of the cervicofacial region after dental procedures. Patients with subcutaneous emphysema usually recover spontaneously without complications, however, early detection and proper management is crucial to prevent complications.

In the literature, there are no reported cases of subcutaneous emphysema during the dental implant prosthesis. However, our purpose is not to add one more case of emphysema to literature, but to show dentists using air pressure instruments in routine dental implant restorative procedures, they could be exposed to this complication.

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