CASE REPORT

Injectable soft tissue filler infection with a similar appearance to an odontogenic abscess

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Abstract
Infection of an injectable soft tissue filler may involve fascial spaces and appears similar to an odontogenic abscess. This case report addresses a 32-year-old female patient with facial swelling who was referred to the department of endodontics for the treatment of a suspected odontogenic infection.

KEYWORDS
fascial spaces, infection, injectable soft tissue fillers, odontogenic abscess

INTRODUCTION

Maxillofacial infections are potentially purulent infections which are mainly related to dental problems such as caries or periodontal lesions and respond favorably to appropriate management. In such cases, lack of timely treatment or inappropriate management may result in a life-threatening condition. Accumulation of pus may potentially lead to perforation of bone and the spread of infection to adjacent soft tissues which often remains localized and confined to surrounding tissue spaces; however, infections have the tendency to directly extend to fascial spaces. Head and neck spaces are potential spaces developed when fascial planes are dissected by accumulation of fluid (i.e., inflammatory exudate) or gas.1

Odontogenic infections of maxillary area often tend to spread into the maxillary vestibular space, buccal space, or canine space.2 One of the challenging points in the management of head and neck infections is to determine the main source of infection.3,4

Over time, in compliance with social trends, more people may desire to inject soft tissue fillers or seek rejuvenation surgeries4–6 to gain a more attractive appearance.

Injectable soft tissue fillers (ISTFs) complications may be related to the material’s characteristics, method of delivery, and reaction of the recipient’s immune system. Practically, they can be classified based on the time of onset.7,8 Rohrich et al. described complications as early (<14 days), late (14 days to 1 year), and delayed (>1 year).5,9 Common early complications include injection-associated discomfort, bruising, edema, itching, and erythema.10 Infections may occur at any time after the procedure. Direct inoculation of infectious agents during the initial injection or the hematologic spread of them is the initial sources of infection. Its clinical manifestations may range from a localized skin infection to a deeper cellulitis or an abscess.11–13 Reactivation of the bacterial colonies in the biofilms may lead to acute purulent infections and sepsis or chronic inflammation. Biofilms are less susceptible to host’s immune system and display antibiotic resistance.14
The present report aims to present a confusing case of maxillofacial infection in the right maxillary region of a young female patient.

2 | CASE REPORT

A 32-year-old female patient was referred to the department of Endodontics, faculty of dentistry, Tehran University of Medical Sciences, by an ENT specialist. The patient complained of a swelling on the right side of her face (maxillary region) and a severe dull pain which could not be localized. In her history, she reported a localized node-like swelling adjacent to the right nasal alae from about 2 weeks ago, which had turned into a generalized swelling with an extension toward the right eye. Clinical examinations revealed a warm, non-fluctuant, firm swelling; extended superiorly to periorbital area and inferiorly to right oral commissure, resembling an infection of buccal and infra-orbital spaces (Figure 1). Submandibular lymph nodes were enlarged with a fluctuant texture. No limitation or pain on mouth opening was detected or reported. No localized swelling or sinus tract was detected in intra-oral examination. No pain was reported on palpation in the right maxillary vestibule. Sensibility tests (cold and electric pulp test) were performed on the teeth adjacent to the swelling. Cavity test was performed on tooth No. 4 (Table 1). No increased pocket depth was observed in the periodontal examination of teeth No. 3–6.

The patient had a recently taken panoramic radiograph (Figure 2). Periapical imaging was also ordered for further investigation. In radiographic examination, no periapical lesions were detected around the suspected teeth (Figure 3).

Since none of the examined teeth could be identified as the probable source of infection, the patient was asked about any recent orofacial interventions; such as any filler injections, cosmetic surgeries in the area, or botulinum toxin injections. Patient reported a filler injection, by a dermatologist, in smile lines about 38 days ago.

Finally, the patient was diagnosed with an ISTF infection. Empirical antibiotic prescription was considered in order to resolve the signs of acute facial soft tissue infection. As patient stated a history of allergy to penicillin, clindamycin was prescribed with a loading dose of 300 mg PO followed by 150 mg q6hr for 7 days. She was also informed about the possible side effects of medication. At 3-day recall, all of the signs and symptoms were subsided. At 7-day follow-up session, all of the symptoms were relieved, and signs of cellulitis were resolved. Patient was then referred to her dermatologist for any further necessary interventions.

3 | DISCUSSION

Dental infections may frequently lead to cellulitis which is defined as a diffuse inflammation of soft tissue spaces. Diffuse edema of the involved soft tissue space causes a massive and firm swelling with pain, tenderness, and redness. Difficulty in opening the eyes may occur as a result of infection in specific fascial spaces. Infections can also originate from a non-odontogenic source.2

Proper management of an orofacial infection requires an accurate diagnosis. The source of infection would be often detected by means of careful examination of the periodontium and teeth.1

In the current case, all of the teeth adjacent to the swelling responded normally to sensibility tests except tooth No. 4, which had a negative response to cold test, but found to be vital after performing the cavity test. Thorough clinical and radiographic examinations failed to find any dental origin for the patient’s signs and symptoms.

Nowadays with the remarkable increased demand for cosmetic interventions, the prevalence of complications is also expected to rise.7 In the recent case, there were some teeth in the area suspected to be the source of infection, but the clinical findings were not consistent with the patient’s signs and symptoms. It is noteworthy that the possibility of a causative relationship between odontogenic infection focus and ISTFs complication has been doubted and this possibility may be considered by practitioners performing ISTF treatment.7
To achieve a correct diagnosis, along with an accurate clinical examination, the clinician needs to be attentive about obtaining a detailed history. However, in some cases of cosmetic interventions, it may be difficult to get thorough related information; as some patients may wish to keep it secret from their partner or spouse or feel embarrassed of declaring their filler injection or even may not consider it as a medical procedure which might be related to the present condition. In the present case, the patient was reluctant to answer the related questions in the presence of her husband. The process of discovering the source of infection becomes even more challenging when the patient is unaware of the risks and complications of an intervention, she/he has received or omits some essential information that she/he deems irrelevant to the current disease. These challenges were both encountered in the present case.

Considering the point of onset, in the current case an inflammatory nodule had appeared 2 weeks after injection which was not treated and had turned into a diffuse swelling. The period between injection and infection has been reported to vary from 1 week to 6 years. According to Rohrich et al., the aforementioned complication could be described as an early complication. Early complications are most likely to occur due to ignoring the principles of sterilization during injection, or insufficient proficiency of the practitioner. Since there is no consensus regarding the effectiveness of a specific antibiotic regimen for the treatment of an infected ISTF, a bacterial culture is recommended. If atypical mycobacteria are suspected, while waiting for the antibiogram results, an empirical antibiotic regimen may be considered. Macrolides or tetracyclins have been represented as the empirical antibiotics which may be continued for 4–6 weeks. In the current case, due to our lack of experience in managing ISTF infections, the patient was prescribed with clindamycin because of a history of allergy to penicillin. Fortunately, the outcome was satisfactory and patient’s signs and symptoms subsided after 3 days. Of course, in such cases, antibiotic treatment can only relieve the inflammatory process and without removing the main source, soon after a while, recurrence is inevitable. Therefore, it is necessary to remove all of the infected materials. This is especially true and indicated in cases with late or delayed-onset infection. In the present case, the patient was referred to her dermatologist for further necessary interventions.

### CONCLUSION

With the increasing demand for ISFTs, the possible complications are also expected to increase. There need to be a strong surveillance by medical regulators when prescribing ISTFs and such interventions should be prohibited in non-medical centers. It is mandatory for the practitioners to provide the candidates for these interventions with detailed information about the possible risks and complications. In cases with atypical fascial space inflammation, asking questions about any previous injection of soft

| Tooth No. | Coronal restoration | Cold test | Electric pulp test | Percussion | Cavity test | Pulpal status |
|-----------|---------------------|-----------|--------------------|------------|-------------|---------------|
| 3         | Amalgam filling     | −         | −                  | −          | Not performed | Previously treated tooth |
| 4         | Amalgam filling     | −         | +                  | −          | +           | Normal         |
| 5         | Composite filling   | +         | +                  | −          | Not performed | Normal         |
| 6         | −                   | +         | +                  | −          | Not performed | Normal         |
tissue fillers, might be beneficial for establishing a correct diagnosis.

**AUTHOR CONTRIBUTIONS**

Mehrfam Khoshkhounejad and Fatemeh Hamidzadeh contributed to the patient’s care and follow-up, and writing the manuscript. Arvin Rezaei Avval contributed to patient’s follow-up and writing the manuscript. Pegah Sarraf contributed to the revision of the manuscript.

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None.

**CONFLICT OF INTEREST**

The authors deny any conflict of interest.

**DATA AVAILABILITY STATEMENT**

The data supporting the findings of the present study, are available from corresponding author upon request.

**ETHICAL APPROVAL**

For clinical cases, the local ethics committee considers that the patient’s consent is sufficient.

**CONSENT**

Written informed consent was obtained from the patient to publish this report in accordance with the journal’s patient consent policy.

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