

# An unusual soft tissue radiopacity – radiographic appearance of a dermal filler

J. Valiyaparambil,<sup>1</sup> K. Rengasamy<sup>2</sup> and S. M. Mallya<sup>3</sup>

## IN BRIEF

- Provides a pictorial illustration of the radiographic appearance of a dermal filler.
- Aids the clinician to differentiate this appearance from pathological conditions.
- Provides an introduction into the indication of dermal fillers.

We present a case that describes the radiographic findings of Radiesse, a calcium hydroxyapatite-based dermal filler. This dermal filler was detected during radiographic examination for implant treatment planning. This case illustrates the typical radiographic appearance of this material and the importance of differentiating it from pathological conditions.

## CASE REPORT

A 58-year-old male was referred by a private dental clinic to the oral and maxillofacial radiology imaging service at the University of Connecticut School of Dental Medicine. The patient was partially edentulous and a panoramic radiograph was made to evaluate the remaining dentition and the edentulous regions for possible implant placement. The patient had significant scarring of the facial skin over the right nasio-labial and zygomatic regions, resulting from a prior surgical excision of a basal cell carcinoma.

The panoramic radiograph showed an edentulous maxilla and a partially dentate mandible (Fig. 1). Implants were present in both maxillary canine regions - there was marked peri-implant bone loss around the implant in the left maxillary canine region. The mandibular dentition was heavily restored with multiple endodontically-treated teeth. An intriguing finding was the presence of a cluster of multiple smaller discrete radiopacities in the maxillary canine-premolar region of both sides. Based on the location and the appearance, we inferred that these calcifications were located within the soft tissue of the cheek

and superimposed over the maxillary arches. The referring dentist confirmed that a similar appearance was also present on periapical radiographs made in his office.

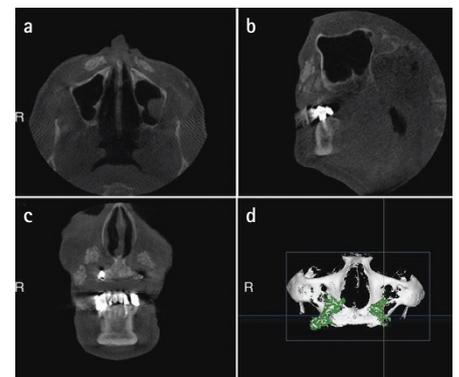
Three days later, the patient was referred back to our imaging service for a cone beam CT (CBCT) to critically evaluate the height and width of bone at the edentulous sites for implant treatment planning (Fig. 2). A CBCT examination was done on a CB Mercuray unit (Hitachi Medical Systems America, Twinsburg, OH), using the following exposure parameters - 120 kVp, 150 mAs and 9-inch field of view. Amorphous mixed density radiopaque masses were seen bilaterally in the soft tissue anterior to the maxilla, extending posteriorly to the zygomatic buttress. The masses were approximately 3 cm x 1 cm x 0.6 cm in dimension, had the radiodensity of trabecular bone and were discrete from the bony walls of the maxilla. The adjacent soft tissues appeared intact. We considered two possible diagnoses for these calcified masses - dystrophic calcification within scar tissue or an exogenous material used for cosmetic augmentation.

We next contacted the patient to review his medical history in detail. The patient's dermatologist provided additional details. The patient had an aggressive basal cell carcinoma (basal cell epithelioma - morphea form) of the skin over the right ala of the nose seven years ago.

The carcinoma was localised, with no distant or regional metastases.



**Fig. 1** Panoramic radiograph. Clusters of small, discrete radiopacities (arrows) superimposed are seen over the maxillary canine-premolar regions.



**Fig. 2a)** Axial, **b)** sagittal, **c)** coronal sections show the presence of radiopaque masses in the soft tissue anterior to the maxilla, **d)** 3D surface-shaded image shows the graft material in green

Histopathological examination revealed perineural involvement. The lesion was treated surgically followed by adjuvant electron beam radiation therapy. The patient underwent multiple surgeries for reconstruction of the surgical skin defects. Approximately six months ago, the patient was treated with subdermal injections of Radiesse, a calcium hydroxyapatite-based soft tissue filler, into both nasolabial folds

<sup>1-3</sup>Section of Oral and Maxillofacial Radiology, University of Connecticut School of Dental Medicine, Farmington, CT, USA

\*Correspondence to: Dr Sanjay M. Mallya  
Email: mallya@nso2.uhc.edu

Refereed Paper

Accepted 2 July 2009

DOI: 10.1038/sj.bdj.2009.764

©British Dental Journal 2009; 207: 211-212

to correct facial wrinkles and the defect from the reconstructive surgeries. Based on this information, we concluded that the radiopaque masses in the zygomatic region represented this tissue filler.

### DISCUSSION

Radiesse (BioForm Medical Inc., San Mateo, CA) is a soft-tissue filler used to correct moderate to severe wrinkles (mainly nasio-labial fold), facial lipoatrophy in HIV patients, augment the vocal chords and as a radiographic tissue marker. Radiesse consists of microspheres of calcium hydroxyapatite (CHA) suspended in an aqueous carboxy-methylcellulose gel and is injected locally. The gel carrier is absorbed over a period of several months and the residual CHA microspheres provide a scaffold for fibroblast ingrowth and eventual generation of collagen.<sup>1</sup> Radiesse is biocompatible, evokes minimum local inflammatory response and is extremely durable in the

facial region.<sup>2</sup> Adverse effects are generally mild,<sup>3</sup> although occasional foreign body reactions have been reported.<sup>4</sup>

The radiodensity of the injected CHA approximates the radiodensity of bone and can be visualised on maxillofacial radiographic examinations, including intraoral, panoramic and CT examinations. It is important to differentiate its appearance from pathological conditions that have a similar radiographic appearance. Such conditions include miliary osteomas of the skin, myositis ossificans, heterotrophic/dystrophic calcifications and foreign bodies. The usually bilateral presence of the material that is separated from bone along with a history of prior injection of this material should point the clinician to make a proper diagnosis. Additionally, clinicians should also keep in mind that resorption of the CHA microspheres may result in a decrease in the radiodensity of the implanted filler over time.

There is an increase in the use of non-invasive methods for facial augmentation. Since 2002, more than 1 million syringes of Radiesse have been shipped worldwide. Thus, it is likely that many of these patients will be seen in dental practices. The present case should aid the clinician to recognize this finding and differentiate it from pathological conditions.

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