Injectable Fillers in Facial Augmentation:  
Review of Radiographic Appearance

Anthony P. Sclafani, MD, FACS., James M. Pearson MD
Division of Facial Plastic and Reconstructive Surgery, The New York Eye & Ear Infirmary, New York, NY
Department of Otolaryngology, New York Medical College, Valhalla, NY
Department of Otolaryngology, The New York Eye & Ear Infirmary, New York, NY

OBJECTIVE: To demonstrate the radiographic appearance of commonly-used injectable fillers in facial augmentation in order to recognize the presence of filler, to compare and contrast characteristics of individual fillers, and to differentiate the presence of filler from pathologic processes using those characteristics. STUDY DESIGN: Case Study. CONCLUSIONS: Injectable fillers used in facial augmentation may be recognized by their characteristic appearances on computed tomography. In this case, a single patient having undergone injection with multiple filler types facilitates direct comparison of filler appearance in a single CT study. The location of filler material in the commonly treated regions of lips, nasolabial and glabellar folds and forehead rhytids aids in the recognition of filler and the differentiation from pathologic processes. As the use of injectable fillers becomes increasingly popular and commonly-practiced, these fillers will be present and detectable on more patients’ CT studies of the face, head and neck. The ability to recognize these fillers and differentiate them from pathologic processes will become an important skill for the surgeon to possess.

MATERIALS AND METHODS

A patient who had undergone treatment over a 3-year period with 4 different injectable fillers was evaluated with computed tomography (CT). The fillers studied include: solid and micronized autologous dermal graft (ADG) (Cymetra), hyaluronic acid (Restylane), calcium hydroxylapatite microspheres (Radiesse), and autologous fat. The CT (axial, coronal, 3-D reconstructions) appearance of each filler is illustrated with regard to characteristic imaging appearance of each filler, target location, and dispersion of injected material.

RESULTS

The appearance of 4 fillers is illustrated. Calcium hydroxylapatite exhibits a strongly radio-opaque appearance, while hyaluronic acid, autologous fat and collagen are comparatively radiolucent, although clearly detectable. Radiolucent fillers are recognizable primarily by their location relative to adjacent tissue planes. Hyaluronic acid is visible superficial to muscle, consistent with its intended target location. Similarly, autologous fat is visible deep within muscle. Solid and micronized ADG is detectable by the fibrosis induced by its presence, which generates slightly more signal than the adjacent muscle.

DISCUSSION

The use of implants in facial augmentation is growing in popularity. Lip implants are indicated for lip augmentation and correction of natural lip asymmetry. This patient underwent treatment over a 3-year period with 4 different injectable fillers in addition to lip implantation with a solid autologous dermal graft (AlloDerm). The presence of multiple filler material and implant in the same patient allows direct comparison of the radiographic appearance of each material relative to the others. The appearance of each filler is described in the results section. Each filler is recognizable by 2 main characteristics: its radio-opacity and its location relative to adjacent tissue planes. Malar augmentation is indicated to increase malar definition and projection. This patient underwent bilateral malar implantation with solid high-density polyethylene implants, but due to an early post-operative infection, only the implant on the left side remained. The patient desired minimally invasive correction and restoration of symmetry, and subsequently was treated with calcium hydroxylapatite on the right side. Radiographically, the implant is better visualized in the axial plane, where it can be seen overlying and conforming to the left malar eminence. The implant material is radiolucent to bone and soft tissue, with a thin layer of signal enhancement visible superficial to the implant, which corresponds to the fibrotic tissue plane between the implant and the overlying soft tissue. Malar augmentation with injectable calcium hydroxylapatite is indicated to restore external symmetry of the malar region. This patient underwent injectable treatment with calcium hydroxylapatite in the right malar region. Calcium hydroxylapatite is clearly identifiable on both axial and coronal planes, and is strongly radio-opaque due to its mineral composition similarly to bone. Soft tissue fillers are being used increasingly in the head and neck, and these materials will be more frequently seen in imaging studies. An understanding of the composition and the radiographic appearance of these materials is essential to adequately interpret radiologic studies of the face, head and neck.

REFERENCES