An Investigation of Changes in Physical Properties of Injectable Calcium Hydroxylapatite in a Carrier Gel When Mixed with Lidocaine and with Lidocaine/Epinephrine

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INTRODUCTION As physicians incorporate calcium hydroxylapatite (CaHA) into their aesthetic treatment regimens, the question has arisen of whether the addition of anesthetic agents to prefilled CaHA syringes might provide sufficient anesthetic prophylaxis to warrant reduction in conventional anesthetic pretreatment procedures.

STUDY DESIGN Investigators sought to determine changes in the physical properties of CaHA induced by the addition of lidocaine and lidocaine with epinephrine into the prefilled CaHA syringe. The CaHA and gel carrier (CHM) were mixed with varying amounts of lidocaine and lidocaine with epinephrine to measure the number of passes back and forth for optimal homogeneity of lidocaine and CaHA in syringes, changes in viscosity, extrusion force, needle jam rates, elasticity, and pH.

RESULTS Ten mixing passes appeared sufficient for homogeneity. Viscosities and extrusion forces of CHM/lidocaine blends decrease with increasing amount of lidocaine. Needle jams do not increase. The pH and elasticity of the CHM/lidocaine blend are essentially equivalent to those of CHM alone. Epinephrine added to lidocaine did not alter the results enough to reach statistical significance.

CONCLUSIONS Addition of lidocaine to original CHM can be safely added without harmful changes in physical properties of the original soft tissue filler. Further studies are required to explore whether the addition of lidocaine to CHM alters patient discomfort, durability, and efficacy.

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Radiesse (BioForm Medical Inc., San Mateo, CA) is a soft tissue filler consisting of calcium hydroxylapatite (CaHA) microspheres, 25 to 45 μm in diameter, and a sodium carboxymethyl cellulose (CMC) carrier gel. Collectively, these two elements constitute the CaHA media, referred to herein as CHM. The filler is usually injected through a 25- to 27-gauge needle, 0.5 to 1.5 inches in length. Over a period of several weeks, the CMC is replaced by fibroblasts and extracellular matrix, leaving the CaHA microspheres in place to provide mechanical support.[1] Even though individual CaHA microspheres are radioopaque, moderate injection amounts do not disrupt most radiographic analysis.[2]

CHM is currently approved for treatment of severe facial folds and wrinkles, such as nasolabial folds, and for treatment of human immunodeficiency virus–associated facial lipoatrophy. Durability is estimated ranging from 10 to 18 months.[3–6] Additional uses of the product in the correction of marionette lines, oral commissures, prejowl sulcus, acne scarring, cheeks augmentations, infraorbital rim, and temporal hollows have been reported.[5,7–13]

Late in 2007, Busso and Applebaum[14] published a report of their experiences in combining CHM with lidocaine for off-label use of the soft tissue filler in treatment of the hand. In the report, Busso and Applebaum briefly explained how mixing the two compounds together appeared to considerably lessen discomfort in patients receiving a bolus of the mixture for hand rejuvenation and augmentation. Busso and Applebaum observed that 0.15 mL of 2% lido-

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