Digital Image Speckle Correlation for the Quantification of the Cosmetic Treatment with Botulinum Toxin Type A (BTX-A) DIVYA BHATNAGAR, Department of Materials Science and Engineering, SUNY Stony Brook, NICOLE CONKLING, Stony Brook University Medical Center, MIRIAM RAFAILOVICH, Department of Materials Science and Engineering, SUNY Stony Brook, ALEXANDER DAGUM, Division of Plastic Surgery, Stony Brook University Medical Center — The skin on the face is directly attached to the underlying muscles. Here, we successfully introduce a non-invasive, non-contact technique, Digital Image Speckle Correlation (DISC), to measure the precise magnitude and duration of facial muscle paralysis inflicted by BTX-A. Subjective evaluation by clinicians and patients fail to objectively quantify the direct effect and duration of BTX-A on the facial musculature. By using DISC, we can (a) Directly measure deformation field of the facial skin and determine the locus of facial muscular tension(b)Quantify and monitor muscular paralysis and subsequent re-innervation following injection; (c) Continuously correlate the appearance of wrinkles and muscular tension. Two sequential photographs of slight facial motion (frowning, raising eyebrows) are taken. DISC processes the images to produce a vector map of muscular displacement from which spatially resolved information is obtained regarding facial tension. DISC can track the ability of different muscle groups to contract and can be used to predict the site of injection, quantify muscle paralysis and the rate of recovery following BOTOX injection.

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