

2nd International Conference on

3D Printing Technology and Innovations

March 19-20, 2018 | London, UK

3D-printed transparent facemask for the prevention and treatment of facial hypertrophic scars

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Hypertrophic scar is a common complication among Chinese population after skin injury. Facial hypertrophic scars would affect physical and psychological wellbeing of the patients as well as the quality of life. Pressure therapy is the standard rehabilitation strategy for prevention and treatment of hypertrophic scarring and transparent facemask is a common form of pressure therapy for facial scar management. Conventional transparent facemask is inconvenient to fabricate, including multiple molding process which is labor force and time consuming. The fabrication method is not tolerable for young children who will need anesthesia. Recently, we developed 3D-printed transparent facemask which is more convenient and efficient to make compared with their traditional ones, and more accurate in fitting. We use biocompatible 3D printing material to produce the facemask and add silicone gel linings on the inside surface which can increase the contact pressure as well as soften the hypertrophic scars. With computer-aided design, the customized 3D-printed facemask can provide balanced and sufficient compression treatment for patient with facial hypertrophic scars. According to our pilot clinical trial, the 3D-printed transparent facemask could effectively improve the condition of facial hypertrophic scars including the thickness, pliability, vascularity and pigmentation. 3D-printed transparent facemask is bearing great potential in bringing the current burn rehabilitation modality to a new era.

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