

Method And Approach To Optimize And Plan Rhinoplasty Surgery

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FULL DESCRIPTION

In modern rhinoplasty, the surgeon utilizes photography as a surgical planning tool. Photoshop can be used to manipulate the skin envelope and give the surgeon and the patient an ideal to strive for in surgery. This method is limited in that it only modifies the skin envelope, not the cartilage structure, which is the structural framework of the nose. A better modality would allow the surgeon to modify the cartilage structure of the nose and see the resulting effects on the surrounding skin envelope.

UCI researchers have developed a method and software to allow the surgeon to manipulate the cartilaginous structure of a composite 3D model of the human nose using a graphical user interface. In this way, the surgeon can modify the model in the same way they plan their surgery. The surgeon can simulate and visualize the immediate mechanical effects of their surgery. Additionally, the program will be able to simulate the effects of wound healing and scar contracture to predict long-term outcomes and to visualize the model's approximate appearance decades after surgery.

Using this software, the surgeon will be able to take a 3D scan of their patient's face in an office-based setting, whereupon the software program will automatically create and insert cartilage and bone structures that are custom to that individual. With this proposed software, the surgeon will make modifications to the cartilage and bone according to their surgical plan using a graphical user interface. Mechanical analysis of the patient's facial structure will be conducted on the modified model to simulate and visualize immediate and long term wound healing, with the ability to vary the degree of contracture due to tissue remodeling and scar formation and simulate fluid-structure interactions of the patient's nasal airway and external nasal valve.

SUGGESTED USES

Plastic surgery

ADVANTAGES

Shows a more accurate representation of the patient's features after reconstructive or cosmetic surgery.

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