

Über die Verschieblichkeit des Gesichtsweichteilmantels und ihren Einfluss auf die markerlose Patientenregistrierung

About the influence of facial skin shift on patient registration in CAS

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Introduction

In cranio-maxillofacial surgery face detection and recognition methods become increasingly accepted, using the patient's facial skin for registration between preoperative imaging (CT, MRI) and the intraoperative surgical site. However, a changing position or mimic activity may change the skin's geometry, generating an incongruence between the preoperatively and intraoperatively recorded facial contours, which leads to inaccuracies during the computer-assisted intervention.

Patients, Materials and Methods

In the present study, face detection and recognition was metrically determined and its influence on the accuracy of patient registration for a navigation system was evaluated. For this purpose, skin laser-scans were made of twelve conscious persons, both in sitting and in supine positions, as well as under mimic activity. Then the laser-scans were referenced to the corresponding CT data-set. The accuracy of data set alignment was checked by artificial landmarks.

Results

Face detection and recognition was reduced by 0.4 mm during severe mimic activity.

Mass related skin shifts reduced the mean accuracy of face detection and recognition by 0.5 mm.

The average accuracy of face detection ranged between

Conclusion

For this reason, especially with patients with a high value on the Glogau photoaging scale as well as patients with a big body mass index, it is important to make sure that the position during CT-acquisition is identical to the position during intraoperative laser-scan registration.