

## **Konzept eines mechatronischen Haltesystems für die Mikrolaryngoskopie**

### **Mechatrical Systems for Microlaryngoscopy**

Sebastian Dressler<sup>1</sup>, Gero Strauss<sup>2</sup>, Markus Krabbes<sup>3</sup>, Andreas Pretschner<sup>3</sup>, Eric Pfeiffer<sup>3</sup>,  
Martin Böttcher<sup>4</sup>, Andreas Dietz<sup>2</sup>

<sup>1</sup>Dept.of ORL, University Hospital Leipzig

Innovation Center Computer Assisted Surgery ICCAS

<sup>2</sup>Dept.of ORL, University Hospital Leipzig, Innovation Center Computer Assisted Surgery  
ICCAS

<sup>3</sup>Hochschule für Technik, Wirtschaft und Kultur Leipzig (FH)

<sup>4</sup>KUKA Roboter GmbH, Department R30-IBD

#### **Purpose**

Microlaryngoscopy is a common method for diagnosis and treatment of laryngeal diseases. The conventional mechanical system of the laryngoscope allows no direct and on-line conclusions on the applied force. Thereby it is not possible to recognize or prevent the appearance of critical forces which cause complications like broken teeth or injuries of the soft tissue. New mechanical calibration of the laryngoscope is necessary even in smaller degrees of movement, e.g. in anterior commissural of the larynx. This study is focussing in the analysis of surgical workflow and the principle technical specification.

#### **Methods**

The idea is to replace the mechanical laryngoscope by a mechatronic assistance system which can be easily and intuitive controlled by surgeon. This system will connected with the laryngoscope and will monitor the forces permanently. Additionally the mechatronical holder can register different views and may re-enter this trajectory by control of the surgeon. We have done first preparative measurements of the appearing forces in a standard operation. For that we placed a force sensor at the end of the laryngoscope and in sync we recorded the alteration of angles of the holder with a camera.

## Results & Discussion

We examined the principles of a mechatronical-assisted laryngoscope for microlaryngoscopy. Like our measurement show, it will be possible to build an adequate small system that will perform the requirements. The concept-study is including the socio-economic parameters (Surgical Integration Profiles).