

Vergleich des Vertrauenspotentials einer CAS-Anwendung und eines konventionellen OR-Systems

Comparing the reliance potential of CAS applications and a conventional OR-system

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Problem

Mechatronic devices are more and more complex. Their performance is influenced by accuracy of data set (e. g. CT), registration error, calibration error, deviation of tools and more. Different methods and standards for error measurements already exist. However, surgical efficiency is not only influenced by the accuracy of a mechatronic system. Parameters relevant to the reliance potential of new technologies in the OR, like usability, robustness, understandability, etc., must be taken into account for a holistic evaluation of CAS systems.

Patients and Methods

In cooperation with the TU Berlin we developed a method for assessing the reliance potential of CAS systems. This checklist is developed as a screening tool covering different factors of reliance. Additionally, existing systems can be compared with respect to their reliance potential. We evaluated the following systems: (a) CT-based navigation in surgery of the pituitary gland comparing with (b) fluoroscopic navigation, (c) CT-based navigation of endonasal sinus surgery (FESS), and (d) videoendoscopic surgery in FESS.

Results

We present data on the reliance potential of CAS-applications and conventional OR-systems. We report whether we found significant differences between the reliance potential of the investigated systems. Application (d) is well established and can be defined as a standard. It is analyzed whether the reliance potential of (a) and (c) may support a routinely application of CAS-navigation and substitution of fluoroscopic navigation (b).

Discussion

Although positioning target error is nowadays in the focus of comparing systems, it is also necessary to pay attention to other factors of the reliance potential, e.g. usability and understandability. With this study we broadened the focus of CAS-system evaluation paving the way for further advancements in the development of suitable mechatronical devices for the OR.