

Genauigkeit des neuen Medtronic iNav elemENT Navigationssystems mit der Tracing Registrierungsmethode in menschlichen Schädeln

Accuracy Study of the new Medtronic iNav elemENT System using the Tracing Registration on cadaver skulls

Klaus Stelter¹, Hagedorn¹, Rasp¹, Leunig¹

¹Klinik und Poliklinik für Hals-Nasen-Ohrenheilkunde der Ludwig-Maximilians Universität
München

Aim

The computer assisted surgery for functional endonasal sinus surgery is already a well established method. However the technical development of new systems which are compact and mobil and therefore easy to move between different locations is still en vogue. The aim of this cadaver study was to evaluate the true application accuracy (TAA) of the new Medtronic iNav elemENT prototype on formalin fixed cadaver heads.

Materials & methods

In this study two formalin fixed cadaver heads with 15 titaniumscrews placed into the skulls, serving as landmarks, were five times registered by the skin tracing registration and the clinical accuracy was evaluated by measuring the difference between the "real" pointer-position and the navigated position. As pointers were used: the Medtronic Registration Pointer and the Medtronic Sucking Device with a 6 mm diameter.

Results

For the frontal registration we found the clinical accuracy of the skin was 0,5 mm of mean value of, for the paranasal sinuses 0,8 mm and for the lateral-skullbase we observed a mean value of 1,2 mm if measured with the Registration Pointer. The results of TAA measured with the sucking device were less precise, because the sucker itself had a diameter of 6mm at the tip and the accuracy depended on which part of the suckertip was

touching the titanium landmarks. We found therefore a clinical accuracy with the sucking device of 5,0mm in the mean value.

Discussion

In the cadaver study we found a high clinical accuracy for the very compact medtronic system. The TAA measured with the Registration Pointer was in the paranasal sinuses below 1 mm, similar results could also be observed for the lateral-skullbase. Our cadaver study demonstrates comparable data to the clinical accuracy observed in our routinely navigated patients and indicates that the new compact Medtronic system provides a similar, if not better accuracy than the routinely used systems.