

Section: Intraoperative Bildgebung

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Abstract-Title:

INTRAOPERATIVE IMAGE UPDATE: FIRST EXPERIENCES WITH THE NEW ERASER® SOFTWARE IN COMPUTER ASSISTED SURGERY OF THE PARANASAL SINUSES
INTRAOPERATIVE BILDAKTUALISIERUNG: ERSTE ERFAHRUNGEN MIT DER NEUEN ERASER® SOFTWARE BEI DER COMPUTER-ASSISTIERTEN CHIRURGIE DER NASENNEBENHÖHLEN

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Abstract-Text:

Purpose:

Computer assisted surgery today is being routinely used in the fields of ENT, maxillo-facial, orthopedic as well as neurosurgery. Taking its limitations and possible failures into account this technology is considered reasonable and helpful in routine paranasal sinus surgery, particularly in revision cases and complex approaches to the frontal and lateral skull base. CT or MRI image data are obtained and used for both registration and intraoperative navigation. But once these data have been acquired so far conventional navigation systems do not provide the opportunity for any modification of the data sets themselves. Especially the surgical progress in the operating field cannot be visualized unless new imaging scans are performed, for example in terms of an open intraoperative MRI. The newly developed Eraser® software (BrainLAB, Germany) allows an intraoperative image update by virtual means without the efforts acquiring a further data set. Our first experiences in paranasal sinus surgery using this new feature shall be described.

Methods and Results:

At our department the Eraser® software so far has been applied in paranasal sinus surgery and in approaches to the anterior skull base. Routine CT and MRI data sets were acquired and transferred to the planning station iplan® ENT and subsequently to the VectorVision2® navigation system. After registration of the patient the surgeon can choose between the conventional navigation and the Eraser® mode and switch back to both features at any time of surgery. The company provides a specially designed Eraser® tool with a spherical tool tip and a pre-calibrated tool geometry. However, following adequate calibration any kind of surgical instrument can be used to create Eraser® objects. With the Eraser® tool, surgically removed tissue volumes can be traced and viewed directly in the diagnostic image data. The traced volume can be colored black to create a visual update of existing patient tissue. Thereby the user gets feedback of the surgical progress in the operating field and the amount of tissue removed in real time. Besides the virtual removal of pathological findings Eraser® objects can be modified in color and opacity to create distinct objects within the image data set. Furthermore generated Eraser® volumes can be overlaid to any other data set and visualized as a 3D object.

Conclusions:

The new Eraser® software represents an interesting and helpful amendment to the conventional computer assisted surgery of the paranasal sinuses. Especially in surgical procedures around bony structures the surgeon gets an accurate virtual image update of the surgical progress and the amount of tissue removed. In cases where a major soft tissue shift will be expected this feature seems to be suitable only to a limited extend. Under these circumstances a real image update has to be performed to maintain adequate intraoperative accuracy.