Endoscopic, transnasal approach to the orbital tumors using image-guided neuronavigation system.

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The aim of the study was to assess the utility of neuronavigation system for endoscopic sampling of intraorbital tumors.

Patients and methods

The biopsy of intraorbital mass lesions was performed in six patients. Localization and size of the tumor, ophthalmological examination findings are summarized in table 1. Medtronic Stealth Station Treon plus (Medtronic, USA) neuronavigation with optical tracking system was used during the procedure.

The extent of ethmoid cells removal was each time tailored according to the localisation and the size of the tumor and complete posterior ethmoidectomy was neccesary only with lesions of the orbital apex. If a tumor was localized close to the floor of the orbit, the approach through the enlarged natural ostium of the maxillary sinus was chosen with subsequent fenestration of the infero-medial orbital wall. Before entering the orbit the precise site of orbital fenestration was determined using neuronavigation. After the site of the lesion in the orbit was successfully determined, a 8-10 mm opening in the bone was created, unless the orbital wall was already damaged and the sample of the tumor was harvested. Intraoperative HP examination was performed to make sure that the biopsy was effective.

Results

The accuracy of neuronavigation ranged from 1.8 to 2.0 mm (on average 1.9 mm) and did not deteriorate during the procedure.

In all patients the lesion was precisely localized and biopsised effectively. Histopathological diagnosis of the tumors are summarized in table 1. In no patient any deterioration of the ocular functions was observed after the procedure.

Discussion

Working with neuronavigation helps the surgeon to keep the operative corridor as confined as possible. Also fenestration of the orbit can be reduced to necessary minimum and this is crucial in preventing excessive prolapse of the orbital content into the nasal cavity with possible consequences for ocular motility.

Endoscopic biopsy of the intraorbital lesions may turn out into a real challenge if the structure of a lesion resembles those of surrounding intraorbital tissues. Neuronavigation proved to be advantageous in endoscopic localization of the lesion, executing the biopsy from a representative, central part of the tumor mass and contributed to reduction of surgical trauma during the procedure.