Pre-operative, intraoperative and post-operative diagnostic value of NBI in visualization of laryngeal and hypopharyngeal lesions

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Introduction

NBI (Narrow Band Imaging) is an optical endoscopic method that helps to evaluate pathological neovascularization in early stage of cancerogenesis. It uses a specially filtered light (blue 415 nm and green 540 nm) and it can visualize the mucosal surface with greater contrast between epithelium and submucosal veins in comparison with conventional white light endoscopy.

Methods

The patients were divided into three groups. In the first group, a total of 170 patients were examined by using NBI within the pre-operative diagnosis of suspected precancerous lesions of the larynx. The second group consisted of 44 patients and NBI was used intraoperatively. In the third group NBI was a diagnostic tool in follow-up of patients after surgical, oncological or combined therapy of malignant lesions of larynx and hypopharynx. In identification of pathological vascularization by NBI we used „IPCL“ (Intraepithelial Papillary Capillary Loops) classification for larynx [Ni et al., 2011].

Results

In the first group IPCL type IV was the most common finding in NBI- a total amount of 71 patients, type III in 25 patients, in smaller quantity suspicious lesions in NBI (type I in 10 and type II in 17 patients). NBI findings suspected from precancerous lesions (severe dysplasia) or malignancy (stage IV-V according to the classification IPCL) was in 69% of cases. From the total number of patients positive histology (meaning at least severe dysplastic changes) was in 41% and negative 59% findings. In 51% were moderate to severe dysplastic changes, in 19% carcinoma in situ, and in 30% invasive squamous cell carcinoma. In the second group it was the most common IPCL type V, in a total of 23 patients, type II in 9 patients, type IV in 8 patients and type III only in 4 patients. In neither case it did not occur type I. Suspect NBI findings (stage IV-V) was in 76% of cases. From the total number of patients positive histology was in 63%, negative in 37%. In 55% there was moderate to severe dysplasia, in 15% carcinoma in situ, and in 30% invasive squamous cell carcinoma. In follow-up group after cancer treatment there was a high number of false positive results in 14/32 patients (44%), which was reflected in a very low specificity of NBI examination (41%).

Conclusion

NBI flexible endoscopy is a very useful method that appears to be promising diagnostic tool in preoperative and intraoperative diagnostics of precancerous lesions and invasive cancer of the larynx, especially in better visualization of superficial spreading tumors. Necessity is using HDTV NBI. In pre-operative diagnostics the NBI method revealed in 9% of cases other new lesions which were not visualized by conventional white light, in 36% of cases the extent of lesions was larger in comparison with the white light endoscopy. We have recorded
approximately the same number of false positive and false negative results (11% versus 12%). Slightly larger difference was within the intraoperative findings in NBI, where the false positive results were in 12% and false negative in 8% of cases. This difference may be partly due to a smaller number of patients. In patients after oncological treatment the importance of NBI decreases (more false positive results), which can be explained by the fact that changes in the mucous membranes after radiotherapy imitate the pathological vascularisation (IPCL) in NBI mode.

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Literature