Endovideolaryngostroboscopy is the obliged evaluation tool in our everyday practice. Standardized protocol in management of broad spectrum of vocal pathology is useful in clinical, scientific and educational evaluation of patient from the first interview till the end of the treatment. Using of contemporary computerised multidimensional analysis of stroboscopic image we are approaching to optimum evaluation of any kind of interpersonal communication disorder. There were 66 patients in prospective clinical study of correlation between suspect endovideolaryngostroboscopic findings and histo-pathology verification of glottis carcinoma. Asymmetric and irregular vibrations with absent mucosal wave or absent vibrations of one part or of the whole vocal fold was improved as carcinoma in 85% of patients. The most frequent diagnosis was Ca planocellularae invasivum G2 NG 2, with subsequent open chordectomy. In every case of hoarseness longer more than 14 days, endovideolaryngostroboscopy is the golden standard for evaluating the need for microlaryngoscopy and biopsy.

Keywords: standardized protocol, multidimensional analysis

INTRODUCTION

Contemporary, there are about ten different terms for endovideolaryngostroboscopy (EVLS), the widespread method in everyday ENT practice. Tarneauaud in 1933, Oertel in 1878., Wendler in 1973. and Kittel in 1978 were the keystones in establishing this visualization of vocal fold vibrations, that had an amazing correlation with Hirano (1974., 1981.) revolutionary describing of multilayered structure. Any pathologic propagation through the basal membrane makes stiffening of superficial or intermediate layer of vocal fold that leads to change of regularity of vibration cycle. The most important part of our daily practice is using of endovideolaryngostroboscopy in early detection of vocal fold infiltration by recognizing the main sign - so called adynamic or no vibrating part of the vocal fold, that is an absolute indication for microlaryngoscopy and histo-pathology verification.

Absent mucosal wave is also a very suspect sign that you can mark as absolute indication for microlaryngoscopy, too. In literature overview we can find that Yumoto has described this theme in 2004.26

In 2005. Rosen 17 and Zeitels 27 emphasized the role of EVLS in phonosurgical practice. Finally, we must think about the limitations of this method, too, as Doellinger and ass. have mentioned4.

METHOD

There is standardised protocol in multidisciplinary team work in our Communication Disorders Care Centre23. The History, Clinical Examination and Endovideolaryngostroboscopy is in routine work in Phoniatric Dpt. We use Karl Storz - rigid 90 degree - Endoskope 20140020 with Telecam - C20212934 PAL CE. We are pointed on oblique four steps:

1. History
2. Indirect laryngoscopy
3. Rigid endoscopy
4. Endovideolaryngostroboscopy

Third and fourth step is detected synchronously with PC connection (TIGER DR SPEECH 2004/ SCOPE VIEW) and stored in database, ready for further analysis, including multidimensional computer analysis of speech and voice. We are pointed on possibility of team repeated analysis (including the surgeon), as well as educational and forensic options too. Microlaryngoscopy and biopsy is performed in Endoscopy Dpt by well trained team. We use Microscope with Camera too5.

As mentioned above, laryngologists are surgery members of our team, and after the treatment, patient is referred to Phoniatric Dpt. to continue with voice and speech rehabilitation that had begun in the first interview.
RESULTS AND DISCUSSION

Evaluation of correlation of suspect endovideolaryngos- traboscopic finding (Figure 1) and positive histological analysis was carried on in prospective clinical study during two years (April 2006 – April 2008.)

There were 59 men and 7 women, 9 of 10 were heavy smokers, the most frequent age was between 51 and 60 years (Diagram 1). The most frequent occupation was physical worker and manager (Table 1). The history was typical; the main symptom was hoarseness, with rare additional symptoms. In 60% of all of them was satisfactory quick sending from primary and secondary health system level (less than 2 months), but unfortunately every tenth patient came to tertiary level after 6 months lasting of symptoms (Diagram 2 ). In the group of patients with absent mucosal wave there were 7 positive and 1 negative correlations (Table 2). In the group of patients with absent vibrations there were 49 positive and 9 negative (Table 3).

In two patients there were false negative results. Owing to clear EVLS findings of absent vibrations on asymmetric side we insisted on repeated biopsy. In both cases the first result was Atypical Hyperplasia, and Carcinoma planocellularae invasivum G2 NG 2 after repeated biopsy. One of them was a woman, non smoker, with fulminate progression after second biopsy, that led to front lateral partial laryngectomy with subsequent radiotherapy (Figure 2). The most frequent therapy in 57 patients with positive correlation, was open chordectomy (Table 4). Unfortunately, you can see that there were two total laryngectomies in cases of pre epiglottis space spreading. EVLS is useful tool in post therapy controlling, too, as shown in Figure 3.

CONCLUSION

The fact that there were positive correlation between EVLS findings and histologic analysis results in 85% of our patients, encourages in pronouncing EVLS as the gold
standard in evaluation of patient with hoarseness longer than 2 weeks. This fact leads to earlier diagnosis, less aggressive treatment and better oncology and functional results. Multidisciplinary team work is the essential in establishing health care system efficacy.

**SUMMARY**

**NEVIBRIRAJUĆI SEGMEN T KAO PATOGNO-MONIĆAN ZNAK GLUTISNOG KARCINOMA**

Endovideolaringostroboskopija predstavlja standardno dijagnostičko sredstvo u našoj svakodnevnoj praksi. Od prvog kontakta do završetka lečenja kod svakog pacijenta primenjujemo protokol koji obuhvata širok dijapazon poremećaja glasa i koji ima klinički, naučni i edukativni značaj. Multidimenzionalnom kompjuterskom analizom registrovanog videostroboškopskog signala približavamo

---

**TABLE 3**

<table>
<thead>
<tr>
<th>FINDING</th>
<th>CA PLANOCELULARAE INVASIVUM</th>
<th>CA PLANOCELULARAE INFILTRATIVUM</th>
<th>CA CORNEUM</th>
<th>CA PLANOCELULARAE MICROINVASIVUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>G2 NG 2</td>
<td>22 M</td>
<td>15 M</td>
<td>1 F</td>
<td>1 M</td>
</tr>
<tr>
<td>G2 NG 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G3 NG 3</td>
<td>3 M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G1 NG 2</td>
<td>2 M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 4**

<table>
<thead>
<tr>
<th>TREATMENT DISTRIBUTION</th>
<th>M</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical TH</td>
<td>26</td>
<td>4</td>
</tr>
<tr>
<td>Open Chordectomy</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Laser Chordectomy</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Radioth</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Laryngect.dot</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Lar.part. front</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>L.part+Radio.</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Chordect.dist.</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Haemilaryngect</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Gottectomy</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>L.part.choris.</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

FIGURE 1
CARCINOMA OF THE RIGHT VOCAL CORD + SULCUS ON THE LEFT

FIGURE 2
REPEATED BIOPSY OF RIGHT VOCAL FOLD

FIGURE 3
STATUS POST RADIOTHERAPY IN LEFT VOCAL FOLD CARCINOMA
se optimalnom nivou zbrinjavanja poremećaja komunikacije. U prospективном клиничким изстраживању код 66 pacijenata uporedili smo povezanost suspektnog endovideoendolaringostroboскопског nalaza sa histopatoloшким верификацијом glotисног carcinoma. Asimetричне и неправилне вибрације уз одсутни мукозни талас или одсутне вибрације једног дела или целе гласнице histопатолошки су потврђене као karcinom u 85% pacijenata. Најчешћа дисфункција била је планоцелуларни инвазивни karcinom, G2 NG 2, чemu се следила хируршка хордеktомија. У случају промуњности дуže од 14 dana, endovideoendolaringostrobosкопија je метода избора у процени потребе за mikrolaringo-goskopijom и histопатолошком верификацијом.

Кључне речи: standardizovan protokol, multidimenzionalna analiza

BIBLIOGRAPHY

4. Doellinger M., Berry A.D., Berke S.G. A Quantitative Study of the Medical Surface Dynamics of an In Vivo Canine Vocal Fold during Phonation. Laryngoscope, 2005; 115(9):1646-54

NOTE – The Power Point adjusted version of this work was presented as Free Paper Presentation in 6. Balkan Congress of Otorino-laryngology Head and Neck Surgery in Thessaloniki, Greece, in October 2nd – 5th, 2008