Comparison of Three Postoperative Follow-up Methods in Patients with Oral Cancer

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ABSTRACT

The goal of this research was to determine the existence of the significant time differences in the identification of the recurrences and neck metastases in the patients surgically treated for the oral cavity cancer by comparing three postoperative follow up methods. The study included 286 patients surgically treated for oral and pharyngeal cancer in period from 1991 to 2007 at three different institutions, divided into three groups based on the different postoperative follow up protocol. In this study we were able to show that the period of identification of recurrences and neck metastases was significantly shorter in the group of patients whose follow up included neck ultrasound, along with methods of inspection and palpation of the oral cavity and the neck. In conclusion, implementation of more contemporary methods such as the neck ultrasound is needed along with usual follow up methods, such as inspection and palpation of the oral cavity and the neck. Also, follow up of the patients surgically treated for the oral cavity cancer should be conducted systematically¹.

Ultrasound examination of the neck should be recommended due to its low cost, harmlessness, possible frequent usage, high quality visual imaging and possibility of combination with the fine needle aspiration cytology (FNAC) of the suspicious lymph nodes.

Key words: oral cancer, pharyngeal cancer, follow up, ultrasound

Introduction

It is well known that management of patients with oral cancer does not end with surgical treatment. Follow up in the postoperative period after oral cancer surgery is almost as equally important as surgical treatment itself due to the high percentage of recurrences and neck metastases within that period². Percentage of recurrences depends on the initial disease stage at the time of surgery as well as on the type of surgical intervention. Namely, the radical operation during the lower stage of the disease leads to the higher percentage of recovery from oral cancer than the same radical operation performed at the higher disease stage.

Another important factor is the type of surgical intervention used for patient management which can be either local tumor excision or local excision with unilateral neck dissection or tumor excision with bilateral dissection of the neck.

Assuming we have clear criteria for the type of surgical treatment needed for the particular stage of the disease³, it is possible to estimate the efficacy of chosen surgical procedure, and at the same time, the efficacy of recurrences detection and neck metastases based on the specific follow up method.

It is important whether recurrences or neck metastases are discovered in the early or advanced stage of disease⁴, because this is crucial factor for the efficacy of the secondary surgical intervention as well as therapy in general⁵. If the unilateral neck metastasis is discovered after the local excision of the tumor, the neck dissection can be performed significantly earlier if the postoperative follow up is adequate⁶,⁷.

Similarly, if the metastases on the contra lateral side of the neck appear after the «commando»⁸ operation, the dissection of that part of the neck can be performed sig-
nificantly earlier if the postoperative follow up is ade-
quate.

Also, if a local recurrence is detected, a secondary sur-
gical intervention can be performed, including tumor ex-
cision with unilateral or even bilateral dissection of the
neck.

This study compares three postoperative follow-up
methods used for 286 patients treated for the oral cavity
and pharyngeal cancer in the period between 1991 to
2007 at Department of Oral and Maxillofacial Surgery,
Rijeka University Hospital Center; Department of Ot-
orhinolaryngology – Head and Neck Surgery, Zagreb Uni-
versity Hospital Center and Department of Oral and Maxillofacial Surgery, Osijek University Hospital Center.

During this period different postoperative follow up
methods were used. The alterations in the follow-up pro-
tocols are the consequences of changes in the consensus
recommendations regarding checkup intervals and intro-
duction of new diagnostic tools in postoperative follow
up10–13.

Despite generally accepted rules there are still some
significant differences among Departments regarding
checkup intervals and used tools for that purpose4,10.

Therefore, the main purpose of this retrospective
study is to evaluate differences in the length of the time
passed before the recurrences or neck metastases were
discovered between three different patient groups surgi-
cally treated at different departments based on the dif-
ferent follow up protocols.

Patients and Methods

The study included 286 patients surgically treated for
oral and pharyngeal cancer in period from 1991 to 2007,
who had local recurrences and/or neck metastases within
2 years after the operation. Data were collected at De-
partment of Oral and Maxillofacial Surgery, Rijeka Uni-
versity Hospital Center; Department of Otorhinolaryn-
gology – Head and Neck Surgery, Zagreb University
Hospital Center and Department of Oral and Maxillofacial
Surgery, Osijek University Hospital Center. The time un-
til the recurrence was observed is shown in months. It
represents the number of months passed from the opera-
tion until the follow up examination which revealed the
suspicion of a local recurrence and/or neck metastases.
In all cases the diagnosis was confirmed either by lymph
node biopsy, tissue biopsy or by ultrasound guided lymph
node cytopunction.

Protocol

Subjects were divided into three groups based on the
postoperative follow up protocol. In the first group,
which consisted of 92 patients, the postoperative follow
up was not systematic and it was conducted upon sur-
geon’s estimation, mainly every 2 to 3 months. The post-
operative follow up included inspection and palpation of
the oral cavity and neck. Diagnostic tests such as neck ul-
trasound, Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) were only conducted in case of
appearance of symptoms or physical examination indi-
cating a possibility of recurrences and/or neck meta-
stases.

The second group consisted of 105 patients who were
systematically followed up, once a month during the first
postoperative year, and once in 2 months during the sec-
ond postoperative year. Examination methods were in-
spection and palpation, whereas neck ultrasound, CT
and MRI were performed only when symptoms or physi-
cal examination indicated a possibility of recurrences
and/or neck metastases.

The third group consisted of 89 patients, who were
systematically followed up, once a moth during the first
postoperative year, and once in 2 months during the sec-
ond postoperative year. Besides inspection and palpation
every physical examination included neck ultrasound26,17
every 4 to 6 weeks during the first postoperative year and
every 8 weeks during second postoperative year. If
the suspected lymph nodes were found the neck ultra-
son sound was followed by ultrasound-guided fine-needle
aspiration cytology (USg FNAC). CT and MRI were con-
ducted if symptoms and signs of recurrence and neck
metastases could not be proven by ultrasound and USg
FNAC18–25.

Also, these 3 groups of patients were further divided
into 4 subgroups based on 4 disease stages according to
1987 IUAC criteria26. This way it was possible to com-
pare patients that were surgically treated at the same
disease stage and were checked up using different post-
operative follow up protocols.

The patients divided into 3 groups, according to their
postoperative follow up protocol, were also divided into 3
subgroups according to the type of surgical intervention
used. The first subgroup included patients who under-
went the local excision of the tumor, either intraoral or
extraoral, without neck dissection (type A). In the second
subgroup, beside tumor excision, unilateral neck dissec-
tion was performed (type B). In the third subgroup, be-
side tumor excision, bilateral neck dissection was per-
formed (type C).

The term excision also implies marginal or segmental
mandibular resection, when required, and the term neck
dissection includes all types of dissection.

Thus, in the letter case, used postoperative follow up
protocols were compared within patient groups that un-
derwent same surgical interventions.

Statistical analysis

Computer program Statistica 4.3, Statsoft, Inc: 1**3,
was used for all statistical calculations. Statistical analy-
sis was performed by Student’s t-test and Mann Whitney
U test. Sign test was used for the comparison of follow up
differences. P values of <0.05 were used as cut-off for
statistical significance.
Results

Comparison of group I and group II follow up

Comparing the length of time when recurrences/metastases were discovered between group I, (follow up was conducted every 2–3 months within two years of postoperative follow up by inspection and palpation) and group II (follow up was more systematic, once a month during the first postoperative year and once in 2 months during the second postoperative year also by inspection and palpation), we found time differences for all four disease stages as well as when patients were grouped based on specific surgical procedure used.

The difference in the length of time until recurrences/metastases were observed between group I and group II, for disease stage 1 was 1 month, for disease stage 2 the difference was 1.1 month, for disease stage 3 the difference was 1.5 month, and for disease stage 4 1.6 month. However, this difference in the time passed until recurrences were observed was statistically significant only for disease stage 2 (p=0.026, Table 1), 3 (p=0.048, Table 1) and 4 (p =0.045, Table 1).

Comparison of group II and group III follow up

Comparing the length of time until recurrences/metastases for all three surgical procedures. The time difference for the type A surgery was 2 months (p=0.0068, Table 2), for type B surgery 3.8 months for type A surgery (p=0.00004, Table 2) and 3.7 months for type C surgery (p=0.0074, Table 2).

When comparing the length of time until recurrences/metastases were observed depending on the type of surgical procedure used, between groups I and III, we found statistically significant differences between groups, which were, 3.8 months for type A surgery (p=0.00004, Table 2), 5.2 months for type B surgery (p=0.000003, Table 2) and 3.7 months for type C surgery (p=0.0074, Table 2).

Comparison of group II and group III follow up

Comparing the length of time when recurrences/metastases were discovered between group II and group III revealed the statistically significant time difference in the identification of recurrences and neck metastases in all four disease stages. For disease stage 1 the difference was 3.7 months (p=0.0091, Table 3), for disease stage 2 the time difference was 3.5 months (p=0.0032, Table 3), for disease stage 3 the time difference was 3.2 months (p=0.00025, Table 3) and for disease stage 4 the time difference was 2 months (p=0.0065, Table 3).

When comparing the length of time until recurrences/metastases were observed depending on the type of surgical procedure used, between groups II and III, we found statistically significant time differences in the identification of recurrences and neck metastases for all three surgical procedures. The time difference for the type A surgery was 2.8 months (p=0.01, Table 3), for the type B surgery
**Table 3**

<table>
<thead>
<tr>
<th>Number of cases group II</th>
<th>Mean number of group II (months)</th>
<th>Number of cases group III (months)</th>
<th>Mean number of group III (months)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>St 1</td>
<td>13</td>
<td>13.3</td>
<td>12</td>
<td>9.6</td>
</tr>
<tr>
<td>St 2</td>
<td>32</td>
<td>11.5</td>
<td>26</td>
<td>8.0</td>
</tr>
<tr>
<td>St 3</td>
<td>35</td>
<td>10.2</td>
<td>32</td>
<td>7.0</td>
</tr>
<tr>
<td>St 4</td>
<td>25</td>
<td>8.0</td>
<td>19</td>
<td>6.0</td>
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<tr>
<td>OP A</td>
<td>22</td>
<td>12.0</td>
<td>18</td>
<td>9.2</td>
</tr>
<tr>
<td>OP B</td>
<td>61</td>
<td>10.6</td>
<td>51</td>
<td>7.0</td>
</tr>
<tr>
<td>OP C</td>
<td>22</td>
<td>8.5</td>
<td>20</td>
<td>6.9</td>
</tr>
</tbody>
</table>

St 1, St 2, St 3, St 4 – disease stages according to International Union Against Cancer, 1987, OP A – local excision of the tumor, OP B – local excision of the tumor with unilateral neck dissection, OP C – local excision of the tumor with bilateral neck dissection.

**Comparison of group I, group II and group III follow up**

Comparing the average length of time until recurrences/metastases were discovered between group I, group II and group III, using one of the three follow up protocols we found statistically significant difference in the length of recurrences/metastases free period between group I and II (p=0.0027, Table 4), group I and III (p=2.2x10^-7, Table 4), and group II and III (p=1.66x10^-5, Table 4).

**Table 4**

<table>
<thead>
<tr>
<th>Group 1 (mean)</th>
<th>Group 2 (mean)</th>
<th>Group 3 (mean)</th>
<th>p</th>
</tr>
</thead>
<tbody>
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<td>11.91</td>
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<td>11.91</td>
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<td>10.45</td>
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<td>10.45</td>
<td>7.42</td>
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</table>

**Discussion**

This study shows statistically significant difference in the length of time until recurrences and neck metastases were discovered, in group of patients whose postoperative follow up was systematical, once a month during first postoperative year, and once in two months during second postoperative year (group II) comparing to the group of patients whose follow up was not systematical, and it was conducted according to the surgeon’s evaluation, mainly every 2 to 3 months, over period of two years (group I). When comparing the length of time until recurrences and neck metastases were discovered in the different stages of disease, between these two groups of patients (group I and group II) recurrences/metastases were discovered significantly earlier within disease stages 2, 3, and 4 in group II. Similarly, when comparing the length of time when recurrences and neck metastases were discovered between groups I and II, depending on the type of surgical procedure used (type A, type B, type C), recurrences/metastases were discovered significantly earlier when type B and type C surgical protocol was used in group II.

Furthermore, the comparison between groups II and III (group III consisted of patients, who’s follow up was systematical and included, besides inspection and palpation, neck ultrasound every 4 to 6 weeks during first postoperative year and every 8 weeks during second postoperative year) showed significantly shorter period of time until recurrences and neck metastases were discovered in patient’s group III.

This observation, that period of time until recurrences/metastases were discovered was much shorter in group III, was statistically significant for all four disease stages as well as for all three types of surgical procedures performed. Comparison between groups I, II and III based on the type of surgical procedure was performed in order to show that differences in the length of time passed until recurrences and neck metastases were discovered are result of efficacy of used postoperative follow up methods, and not a result of different surgical treatments since all three types of surgical procedures were performed on almost equal proportions of the patients in all three groups.

Thus, this study showed the importance of a systematical follow up, as opposed to a follow up based upon physician’s estimate. Follow up periods varying from once a month during the first postoperative year to once in two months during the second postoperative year are consistent with the data which show that majority of recurrences and neck metastases are discovered by the end of the first postoperative year, and almost all recurrences/metastases by the end of the second postoperative year.

The results are even better if the usual, above mentioned methods are supplemented with regular ultrasound examinations combined with ultrasound guided fine needle aspiration cytology. This study showed that combination of the classic follow up methods and ultrasound examination are superior over classical check up methods alone.

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