Original article

Otorhinolaryngologists’ personal treatment preferences (total laryngectomy or laryngeal preservation) when faced with advanced stage laryngeal cancer

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\textbf{ABSTRACT}

\textbf{Objective:} To analyse the treatment options that otorhinolaryngologists would consider if faced with advanced stage laryngeal cancer amenable to total laryngectomy or an organ preservation protocol. \textbf{Material and methods:} Prospective study conducted in a French Teaching Hospital based on questionnaires filled in by 163 otorhinolaryngologists in 2012, studying the percentage chance of cure that they would be prepared to trade-off to preserve their larynx, defining the additional information that they would like to receive and identifying any statistical associations between these parameters and various medical and socioeconomic variables. \textbf{Results:} A total of 42.3% of otorhinolaryngologists would not consider the slightest trade-off to preserve their larynx and preferred to undergo total laryngectomy. In the group of otorhinolaryngologists who would consider a larynx preservation protocol (57.6%), the percentage chance of cure that they would be willing to trade-off to preserve their larynx ranged between 5 to 100% (median: 15%) and 4.2% of them were willing to trade-off all chances of cure (100%) to avoid total laryngectomy. The percentage of otorhinolaryngologists who would not consider trading off the slightest chance of survival to preserve their larynx increased from 29.3 to 49.5% (\(P = 0.01\)) when they participated in multidisciplinary consultation meetings. In the group of otorhinolaryngologists who would consider a larynx preservation protocol, the median percentage survival trade-off that they would consider in order to preserve their larynx (i) decreased from 20 to 10% (\(P = 0.004\)) when they participated in multidisciplinary consultation meetings and (ii) increased regularly with their number of years of practice (\(P = 0.03\)) and their age (\(P = 0.025\)). Finally, 25.1% of otorhinolaryngologists wanted to receive additional information, although none of the variables analysed affected this desire for more information. \textbf{Conclusion:} Treatment options considered by otorhinolaryngologists faced with advanced stage laryngeal cancer were almost equally divided between total laryngectomy and larynx preservation. Number of years of practice and regular participation in head and neck cancer multidisciplinary consultation meetings were variables that significantly influenced this choice.

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\section{Introduction}

Over the last 20 years, larynx preservation protocols have been developed as an alternative to total laryngectomy for advanced (stage III-IV) laryngeal cancer [1–8]. These protocols “trade off” laryngeal preservation for a possible loss of a small percentage of survival. Information is central to this “trade-off” decision, both legally [9] and in terms of the doctor-patient relationship, especially as several studies [10,11] have emphasized that laryngeal preservation was not the main treatment objective shared by all patients. Several studies [12–14] have highlighted not only the importance of the information given to the patient, but also the methodology used to provide this information. The person who informs the patient therefore plays an essential role. The present prospective study was consequently designed to evaluate how French otorhinolaryngologists in clinical practice would consider
this “trade-off” if faced with advanced stage laryngeal cancer, and whether the various medical and socioeconomic variables of these specialists may influence this decision.

2. Material and methods

This prospective study was based on analysis of the responses provided to a questionnaire filled in by 169 French otorhinolaryngologists in clinical practice. This population represented a subgroup of the 1649 French otorhinolaryngologists for whom the e-mail address was available to our teaching hospital department of otorhinolaryngology and Head and Neck Surgery and to whom the questionnaire was sent during the months of September to November 2012 (with two reminders), i.e. a response rate of 10.2% (169/1649).

The first part of this questionnaire, presented in Table 1, recorded various medical and socioeconomic variables concerning otorhinolaryngologists participating in this study and the second part of the questionnaire comprised the following three questions:

- if you suffered from advanced laryngeal cancer, would you choose to be treated by chemoradiotherapy to avoid total laryngectomy and its consequences, even if this treatment decreased your chances of cure (i.e. probability of lasting disease-free survival) rather than total laryngectomy: yes/no?
- If you answered yes, please indicate what percentage chance of cure would you be prepared to trade off to avoid total laryngectomy?
- Do you need more information in order to answer questions 1 and 2 and if yes, what information?

Two questionnaires with inconsistent data (two otorhinolaryngologists aged 22 and 24 years with two and six years of practice, respectively) and four incomplete questionnaires were excluded from the analysis. A total of 163 interpretable questionnaires were therefore entered into a PC database and analysed by Statview software (SAS, Berkeley, USA). The objective of this analysis was to:

- determine the percentage chance of cure that otorhinolaryngologists would consider trading off in order to preserve their larynx;
- describe the additional information that otorhinolaryngologists wished to receive;
- identify any statistical associations between the percentage chance of cure that otorhinolaryngologists were prepared to trade off in order to preserve their larynx or the additional information that they wished to receive and socioeconomic variables (Table 1).

Parametric Fisher t tests, nonparametric Mann-Whitney U tests and linear regression were used with a limit of significance of 0.05.

3. Results

Sixty-nine (42.3%) of the 163 otorhinolaryngologists would not consider any survival trade-off in order to preserve their larynx and preferred total laryngectomy. On univariate analysis, only one variable significantly influenced this decision (Table 2). The percentage of otorhinolaryngologists who would not consider any survival trade-off to preserve their larynx increased from 29.3% in the absence of regular participation in head and neck cancer multidisciplinary consultation meetings to 49.5% when these practitioners regularly attended these meetings (P = 0.01).

In the group of 94 otorhinolaryngologists (57.6%) who would consider a larynx preservation protocol, the survival trade-off they would consider in order to preserve their larynx ranged from 5 to 100% (median: 15%) and 4.2% (4/94) of these practitioners would consider a 100% trade-off in order to preserve their larynx. On univariate analysis, two variables significantly influenced the percentage chance of cure that otorhinolaryngologists were willing to trade-off in order to preserve their larynx (Table 3). The first variable was participation in multidisciplinary consultation meetings: the median trade-off that otorhinolaryngologists would consider in order to preserve their larynx ranged from 20% among practitioners not participating in head and neck cancer multidisciplinary consultation meetings to 10% among practitioners participating in these meetings (Fig. 1, P = 0.004). The second variable was the number of years of practice, as older otorhinolaryngologists (Fig. 2, P = 0.025) and otorhinolaryngologists with a greater number of years of practice (Fig. 3, P = 0.03) were more likely to consider a higher survival trade-off in order to preserve their larynx.

Additional information was requested by 25.1% (41/163) of otorhinolaryngologists (Table 4) before deciding on a treatment option. None of the variables analysed significantly influenced the desire to receive additional information. In 8.5% of cases (14/163), the additional information requested addressed tumour characteristics that could guide the treatment decision and in 15.9% of cases (26/163) the additional information addressed data specifically related to the two treatment options considered. Finally, 3%
Table 3
Univariate analysis of the percentage survival trade-off that 94 otorhinolaryngologists would consider to preserve their larynx.

<table>
<thead>
<tr>
<th></th>
<th>Median (range)</th>
<th>Median (range)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender: male/female</td>
<td>30 (5–100)</td>
<td>10 (5–100)</td>
<td>0.4</td>
</tr>
<tr>
<td>Age (years): median (range)</td>
<td>Linear regression</td>
<td>0.025</td>
<td></td>
</tr>
<tr>
<td>Socioeconomic data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single: yes/no</td>
<td>20 (5–100)</td>
<td>15 (5–100)</td>
<td>0.3</td>
</tr>
<tr>
<td>Children: yes/no</td>
<td>15 (5–100)</td>
<td>20 (5–50)</td>
<td>0.6</td>
</tr>
<tr>
<td>Participation in MCM: yes/no</td>
<td>10 (5–80)</td>
<td>20 (5–100)</td>
<td>0.004</td>
</tr>
<tr>
<td>Exclusively private practice:</td>
<td>15 (5–100)</td>
<td>20 (5–100)</td>
<td></td>
</tr>
<tr>
<td>yes/no</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of years in practice</td>
<td>Linear regression</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>Number of patients with laryngeal cancer treated or followed over the last twelve months</td>
<td>Linear regression</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Medical data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking: yes/no</td>
<td>15 (5–100)</td>
<td>20 (5–100)</td>
<td>0.5</td>
</tr>
<tr>
<td>Personal history of cancer:</td>
<td>10 (5–100)</td>
<td>20 (5–100)</td>
<td>0.9</td>
</tr>
<tr>
<td>yes vs. not</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family history of cancer:</td>
<td>12 (5–100)</td>
<td>20 (5–100)</td>
<td>0.5</td>
</tr>
<tr>
<td>yes vs. not</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MCM: Multidisciplinary Consultation Meeting.

Fig. 1. Distribution (box and whisker plot) of the percentage survival trade-off considered by 94 otorhinolaryngologists preferring a larynx preservation protocol according to regular participation (yes vs. no) in multidisciplinary consultation meetings.

Fig. 2. Linear regression (age and percentage survival trade-off considered by 94 otorhinolaryngologists to preserve their larynx).

Fig. 3. Linear regression (number of years of practice and percentage survival trade-off considered by 94 otorhinolaryngologists to preserve their larynx).

Table 4
Additional information requested by 41 of the 163 otorhinolaryngologists.

<table>
<thead>
<tr>
<th>Additional information requested</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tumour characteristics</td>
<td>14</td>
</tr>
<tr>
<td>Response to induction chemotherapy</td>
<td>8</td>
</tr>
<tr>
<td>T stage</td>
<td>7</td>
</tr>
<tr>
<td>N stage</td>
<td>4</td>
</tr>
<tr>
<td>Cartilage invasion</td>
<td>3</td>
</tr>
<tr>
<td>Vocal cord mobility</td>
<td>1</td>
</tr>
<tr>
<td>Treatment data</td>
<td>26</td>
</tr>
<tr>
<td>Expected survival according to age and/or general status</td>
<td>13</td>
</tr>
<tr>
<td>Treatment options if failure after chemoradiotherapy</td>
<td>6</td>
</tr>
<tr>
<td>Adverse effects of chemoradiotherapy</td>
<td>4</td>
</tr>
<tr>
<td>Possibilities of speech after total laryngectomy</td>
<td>3</td>
</tr>
<tr>
<td>Quality of life after chemoradiotherapy</td>
<td>2</td>
</tr>
<tr>
<td>Specialist opinion</td>
<td>2</td>
</tr>
<tr>
<td>Time for reflection</td>
<td>1</td>
</tr>
<tr>
<td>To be discussed in the real-life situation</td>
<td>5</td>
</tr>
</tbody>
</table>

(5/163) of otorhinolaryngologists indicated that it was difficult to answer the questionnaire because they did not have advanced stage laryngeal cancer.

4. Discussion

Several studies in the field of oncology have illustrated the importance attributed by the patient to the surgeon’s opinion when two conservative and non-conservative treatment options are available. For example, in women with breast cancer amenable to breast-conserving treatment or mastectomy, Smitt and Heltzel [15] and Temple et al. [16] both emphasized that the treatment recommendation proposed by the surgeon and the patient’s perception of her chances of cure were the two main factors significantly influencing their treatment decision. Similarly, Molnar et al. [17] noted that the patient’s perception of the treatment option considered by the surgeon for this type of breast cancer had a major impact on their treatment decision. In men with prostate cancer amenable to conservative treatment or prostatectomy, Diefenbach et al. [18] emphasized that the element most significantly influencing the treatment decision was the surgeon’s recommendation. Song et al. [19] reported that the surgeon’s opinion had a greater impact on the treatment decision in younger men and/or when the cancer was considered to be invasive. Finally, in 2007, in a cohort composed of 101 patients who had participated in the first prospective study (RTOG 91-11) [1] devoted to laryngeal preservation in advanced stage laryngeal cancer, Foote et al. [20] noted that four variables significantly influenced the patient’s treatment...
decision: discussion of the various treatment options with the surgeon, the treatment option recommended by the surgeon, the possibility of larynx preservation surgery and referral to a medical oncologist [20].

The weight of the surgeon’s opinion in the classical trade-off between cure and a chance of organ preservation with which cancer patients are faced led us to analyse the trade-off that otolaryn-

laryngologists would consider if they were placed in a hypothetical situation of laryngeal cancer amenable to either a larynx preser-
vation protocol or total laryngectomy. The results of this study must be interpreted cautiously, as this study was based on anal-

ysis of the responses of otolarynologists not specifically affected by the disease studied, but simply placed in a hypothet-

ical situation of laryngeal cancer. This factor could be considered to constitute a major bias, which limits the scope of the conclusions. However, we do not share this point of view for several reasons. Although it has been recognized, in the field of psycho-oncology, that announcement of a diagnosis of cancer induces a state of shock that modifies the mental processes of resistance and reaction, no study has evaluated the real impact of this announcement on the choice of treatment trading off survival versus function. It should also be noted that only 3% of the otolarynologists in our study who returned the questionnaire considered that the fact of not actually having laryngeal cancer would affect their responses (Table 4).

In our study, 8.5% of the otolarynologists who returned the questionnaire wanted to receive more information concerning the tumour characteristics before considering their treatment deci-
sion (Table 4). This very low rate is somewhat surprising, as not all advanced stage laryngeal cancers are equal in terms of eligibility for larynx preservation protocols and our questionnaire made no mention of any of the factors in favour of a larynx preservation pro-
tocol (low T stage, N0 stage, absence of extension beyond the larynx, extensive cartilage invasion or invasion of the pre-epiglottic com-
partment, protein p53 expression, HPV 16 infection and a very good clinical response to induction chemotherapy) [1–8]. This low rate could possibly be explained by the fact that, as they did not really have laryngeal cancer, the majority of otolarynologists who answered this questionnaire did not feel directly affected, but one also wonders whether all otolarynologists are really familiar with these data.

The first striking result of this study is that 42.3% of otolarn-

laryngologists would not consider the slightest survival trade-off to preserve their larynx. Other important results are the low per-

centage of otolarynologists (4.2%) who would consider a 100% trade-off to preserve their larynx and the very broad distribution (5–100) of the percentage trade-off that otolarynologists would consider in favour of an organ preservation protocol to avoid total laryngectomy, with a median of 15%. In a prospective study with a similar design, conducted in our department on a cohort of outpatients [14], 28.6% of subjects would not consider the slightest trade-off to preserve their larynx and the median percentage of survival that subjects would consider trading off to preserve their larynx was 33%. Comparison of these two studies indicates that otorhinolaryngologists are less inclined than their patients to trade-off survival to preserve their larynx. Fur-

more, the rates obtained in our study are not in agreement with data published by Demez and Moreau [21] as to the treat-

ment options that otolarynologists would consider for their cancer patients. In this questionnaire-based study conducted on a cohort of 500 otorhinolaryngologists, 75% of these specialists thought that it was justified not to perform curative treatment if this treatment induced an alteration of quality of life. These find-
ings raise the question of a possible marked disparity, in the context of head and neck tumours, between what otolarynologists propose for their patients and what they would consider if they were personally affected by the same disease. These data raise the following philosophical question: “Would I propose to my patient a therapeutic procedure that I would refuse for myself?” This subject of debate, with a highly ethical connotation, has already been raised by Huy [22], who, in a letter to the editor devoted to the treatment of acoustic neuroma published in The Lancet in 1998, emphasized that the choice of treatment (gamma knife) con-

sidered by the majority of otolarynologists if they had an acoustic neuroma was not in agreement with the standard clin-

ical practice at the time (surgical resection) still predominantly recommended to patients by the same practitioners. Our study does not provide an answer to this question, but reveals that two variables have a statistically significant impact on the results obtained.

The first variable that influenced the treatment decision con-
sidered by otolarynologists when placed in a situation of advanced stage laryngeal cancer is participation in a head and neck cancer multidisciplinary consultation meeting. The percentage of otolarynologists in the present study who would not con-

sider the slightest trade-off to preserve their larynx increased from 29.3% in the absence of regular participation in multidisciplinary consultation meetings to 49.5% when otolarynologists regu-

larly attended such meetings (P = 0.01). The median percentage trade-off that otolarynologists were prepared to accept to preserve their larynx ranged from 20% in the absence of partic-

ipation in multidisciplinary consultation meetings to 10% when otolarynologists participated in such meetings (P = 0.004).

Otolarynologists faced with a hypothetical situation of advanced stage laryngeal cancer who regularly participated in head and neck cancer multidisciplinary consultation meetings there-

fore appeared to prefer total laryngectomy rather than a larynx preservation protocol. This result could be explained by the fact that otolarynologists who participate in these multidisci-

plinary consultation meetings are very familiar with laryngeal preservation for advanced stage laryngeal cancer and are very well informed about the considerable complication and failure rates, the difficulties encountered to treat these complications and their consequences and failures in terms of survival and quality of life.

The second variable that influenced the treatment decision con-
sidered by otolarynologists placed in a hypothetical situation of advanced stage laryngeal cancer is the number of years of prac-
tice. In the group of 94 otolarynologists who would consider a trade-off to preserve their larynx, this percentage increased regu-

larly with the otolarynologist’s age (Fig. 2, P = 0.025) and the number of years of practice (Fig. 3; P = 0.03). Function there-

fore appears to take precedence over survival with increasing age of otolarynologists. This is an interesting point, as multidisci-

plinary consultation meetings are generally chaired by the most senior specialist.

5. Conclusion

This prospective study demonstrates that laryngeal preser-

vation is not the primary treatment objective shared by all otorhinolaryngologists placed in a hypothetical situation of

advanced stage laryngeal cancer. It shows that regular participation in multidisciplinary consultation meetings and the otorho-

nologist’s age significantly influence the treatment decision considered. The authors hope that this study will encourage the reader to reassess a number of ethical issues and will help to improve the medical information delivered to patients with advanced stage laryngeal cancer. A complementary study analysing and comparing two cohorts of otorhinolaryngologists and radio-

therapists is currently underway.
Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

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