

AdOnco Database – Six Years' Experience with the Documentation of Clinical and Scientific Data on Patients with Head and Neck Cancer

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Abstract. *Purpose: To report the experience with AdOnco, a computerized database for head and neck cancer patients. Patients and Methods: AdOnco is a Filemaker Pro 6.0 based database integrated into the local network of the host ENT department. It is used by the physicians as a clinical and scientific documentation system to store and retrieve information about all patients with head and neck cancer referred to the host oncology center. This study reviews the achievements to date of AdOnco and, as an example of its enormous data evaluation potential, presents survival curves of patients with laryngeal cancer undergoing laser resection. Results: Over a period of six years, the data of 881 patients with head and neck cancer were entered into the AdOnco database. Conclusion: AdOnco has proven to be a useful patient database and documentation system which has become an integral and essential part of daily clinical routine and also a valuable research tool.*

Head and neck cancer accounts for about 5% of all malignancies worldwide (1). More than 500,000 cases are newly diagnosed around the world each year, including 100,000 in Europe alone. More than 90% of head and neck cancers are of squamous cell origin, and the majority of patients admitted to the hospital present with locally and regionally advanced disease (2). Generally, there are three

treatment options for patients with head and neck cancer: surgery, induction chemotherapy followed by adjuvant radiation or chemoradiation, or primary radiotherapy or radiochemotherapy.

Few patients present with early-stage disease. These are treated with surgery and in some cases with additional radiotherapy, and nearly 80% of them are cured. Chemotherapy added to locoregional treatment has been shown to confer a survival benefit in non-metastatic squamous-cell cancer of the head and neck (3). However, despite significant advances in the use of surgery, chemotherapy and radiation to treat head and neck cancer, prognosis has improved only marginally over the past 30 years and still remains poor (4).

The most commonly used chemotherapeutic agents, cisplatin and carboplatin, are often combined with taxanes and/or 5-fluorouracil. Despite response rates to first-line platinum-based chemotherapy of up to 90%, the duration of therapy is limited due to significant toxicity (5). In addition to seeking new treatment strategies, detailed documentation of the clinical data of head and neck cancer patients is becoming increasingly important. Only a precise documentation of diagnosis, staging, treatment, follow-up and outcome provides physicians with all necessary information to give the patients appropriate advice and make clear treatment decisions in a time-saving, efficient way in the setting of daily patient care. Therefore, data management using flexible database solutions has become an essential tool in the hands of both clinicians and researchers in modern oncology. This is the reason behind the development and implementation of AdOnco, a Filemaker Pro 6.0 based documentation program, in the host ENT department (6, 7). This study reports the department's experience with this platform from 2003 to 2009, also giving an example of its remarkable potential for analyzing clinical data.

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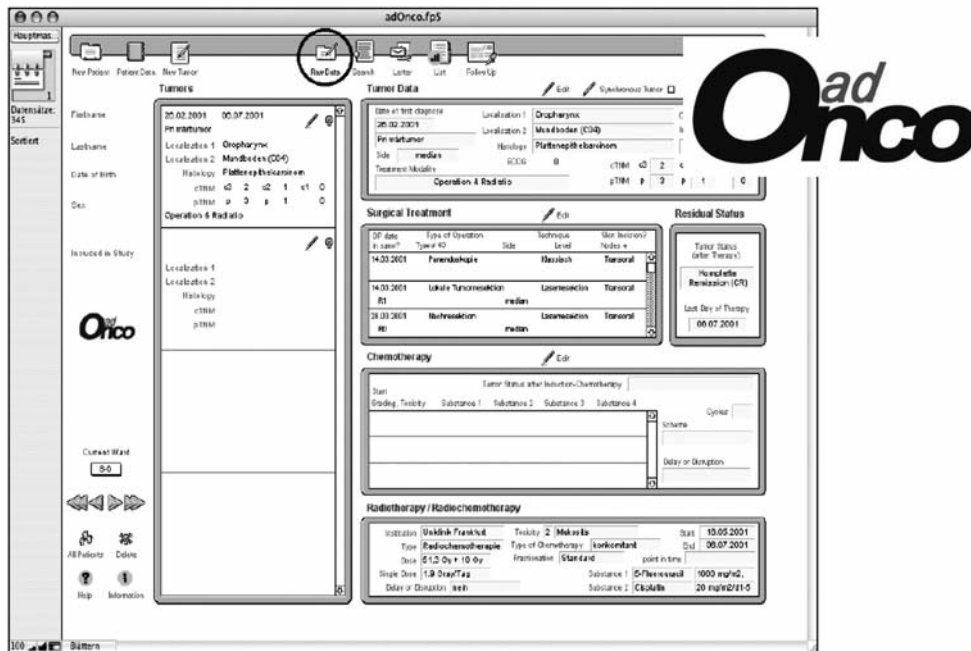


Figure 1. The user interface of AdOnco was customized for easy data input. In the window on the left, all essential oncological data are presented, and details for selected neoplasms are shown on the right side of the screen. For more detailed information on tumor and treatment, separate windows can be opened.

Patients and Methods

In 2003, the AdOnco database based on Filemaker Pro 6.0 (Filemaker Inc, Santa Clara, California, USA) was developed and integrated into the local network at the host ENT cancer center. Backups were made automatically on a daily basis. Data from all patients with malignancies of the epipharynx, oral cavity, oropharynx, larynx, hypopharynx, sinuses and salivary glands were entered into the database. As shown in Figure 1, AdOnco provides a clearly arranged user interface to allow quick and easy documentation of all kinds of clinical and laboratory data. On the main screen, all data are to be entered in chronological order by the time of diagnosis. For each tumor patient, a separate record (relation) is then created where all tumor-specific data including tumor site, tumor stage according to the TNM system, primary involvement of the lymph nodes, histology and, if appropriate, other synchronous malignancies can be documented. Because of the system's structured menu, physicians always get an immediate overview of each individual patient's data. Thus, the essential requirements for a clinically useful head and neck cancer database are fulfilled by AdOnco, namely the ability to enter, edit and track patient data during clinical routine with a minimum expenditure of time. In all cases, physicians of the outpatient clinic, the operating rooms and the inpatient wards entered data during regular working hours only.

Results

Within the past 6 years, data from 881 patients with head and neck cancer were collected in accordance with the tumor

staging and treatment criteria of the World Health Organization. Two appointed employees of the medical service continuously checked data reliability. Generally, physicians accepted the database very well because it allowed, among other features, time-sparing follow-up examinations. Also, the quality of the written medical reports was improved during the past few years because detailed information for the referring physicians could be incorporated automatically from AdOnco. For the researchers, the database could rapidly provide outcome data for various treatment modalities.

In the past six years, data from 881 patients (661 males and 220 females) with head and neck cancer were entered into the AdOnco database. The tumor sites included the oropharynx (277 patients, 31%), oral cavity (77 patients, 9%), larynx (233 patients, 26%), hypopharynx (111 patients, 13%), nasopharynx (26 patients, 3%) and various other localizations including ear, skin and sinuses (157 patients, 18%). Of all 881 patients, 699 were treated with curative intent and 182 for palliation; 573 patients received primary surgery, 243 patients underwent primary conservative treatment such as induction chemotherapy and adjuvant radiochemotherapy, and 65 patients had primary radiation or chemoradiation.

As an example of the remarkable potential of the AdOnco documentation system to evaluate clinical data for research purposes, data from 233 patients with laryngeal cancer are

Table I. *TNM classification of the 112 patients with laryngeal cancer who had laser resection of their tumor.*

T/N	N0	N1	N2	N3
T1	61	9	23	2
T2	5	4	0	1
T3	1	2	2	2

reported. 112 of these patients were treated with laser surgery of their tumor; the data obtained from the AdOnco database for this subgroup of patients are shown in Table I and Figures 2 and 3. Specifically, the TNM classification of the 112 patients with laryngeal cancer who had laser resection of their tumor is summarized in Table I. Figure 2 shows the overall survival curve and Figure 3 the recurrence-free survival curve for the 112 laser-resected laryngeal cancer patients. At 30 months after resection, 90% of the patients were alive and 78% were still recurrence-free.

Discussion

AdOnco was developed to serve as a tumor documentation system for clinical as well as scientific use. In the past six years, AdOnco became an integral part of daily clinical routine in the host ENT cancer center. AdOnco has improved the quality of oncological documentation and reduced the time and effort of follow-up examinations and other clinical routine work such as writing patient reports. It gives an intelligent overview of data of clinical and scientific interest, including the incidence of specific tumor entities, guidance to treatment decisions and evaluation of survival data as illustrated in the example of laser-resected laryngeal cancer patients. To improve knowledge of rare ENT tumors, it will be useful to establish the same database in other ENT departments and combine selected data on an online basis. Another useful feature of AdOnco is its integrated statistical tool, which allows researchers to perform statistical analyses without the need to export the data into another program. Ultimately, the usefulness of any clinical documentation program depends on its acceptance by the physicians to enter their data continuously. Therefore, new colleagues in the host department are trained in the use of AdOnco.

Since the introduction of clinical databases, many systems have been developed, for example in the fields of gynecologic oncology (8, 9), radiotherapy (10), hematologic oncology (1) and head and neck cancer (11-13). It is a major advantage of AdOnco that it provides an immediate and precise overview of the complex oncological history of each patient during follow-up examinations. This is extremely helpful for the oncologist in charge to save time. This study,

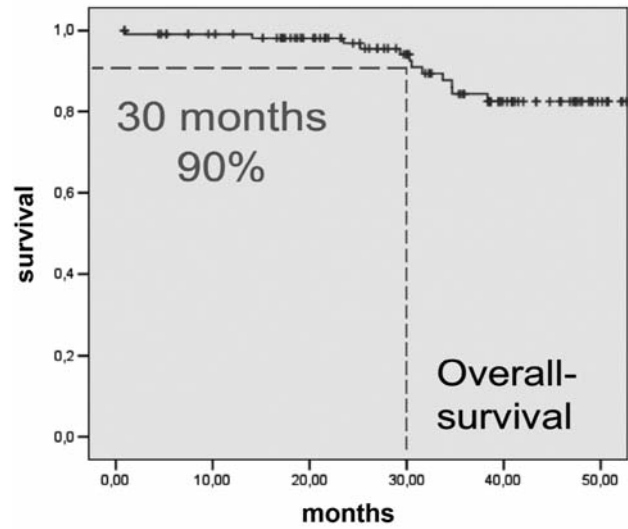


Figure 2. *Overall survival curve for the 112 laser-resected laryngeal cancer patients. At 30 months after resection, 90% of the patients were alive.*

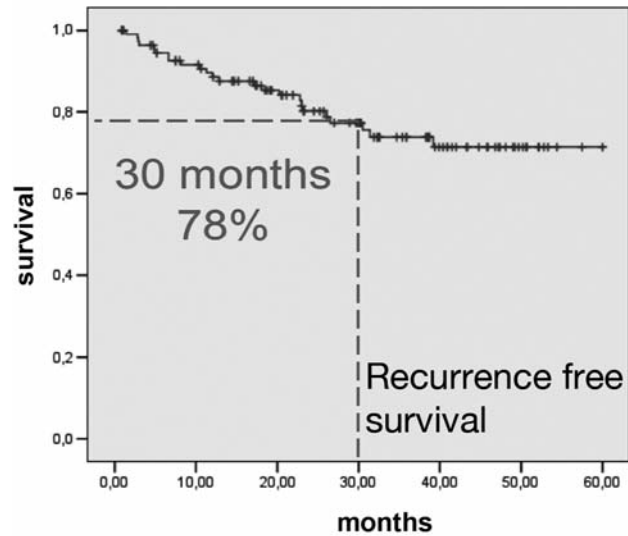


Figure 3. *Recurrence-free survival curve for the 112 laser-resected laryngeal cancer patients. At 30 months after resection, 78% of the patients were still recurrence-free.*

therefore, recommends the broad use of AdOnco both for clinical documentation and research purposes.

Conclusion

The AdOnco database has been a story of success ever since it was implemented at the host ENT department in 2003, and has meanwhile become an integral part of daily clinical care

for patients with head and neck cancer attending the host cancer center. Before entering AdOnco in daily clinical work there was no capability for a systematic and valid documentation of cancer patient data. Useful features of the database include the possibility to edit and view individual patient data during clinical routine and to rapidly provide a detailed overview of each patient's oncological history. AdOnco has also proven helpful to address scientific questions based on the wealth of patient data included in the database, as demonstrated by the example of laser-resected patients with laryngeal cancer. Although other tumor databases have been developed in recent years, AdOnco appears to stand out because of its easy and time-sparing data handling.

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