

# Outcomes of head and neck cancer surgery in patients over the age of 80

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**Abstract** Persons of advanced age present an increasing part of the population. Despite frequency and clinical relevance only few facts are known concerning the results and the tolerance of the therapy of head and neck cancer in old patients. Outcomes of surgery in general anaesthesia in 29 patients with head and neck cancer over 80 years of age were documented prospectively in the present study. For all surgical procedures postoperative hematoma was occurred in 2 patients undergoing neck dissection. Other wound related complications could not found. One patient showed angina pectoris symptomatic and atrial fibrillation postoperatively and one patient died of myocardial infarct on eighth postoperative day. Patients with cardiac complications had an anamnestically known severe coronar artery disease and cardiac failure. On the basis of data from the literature and the presented results chronological age alone should not be a contraindication to adequate head and neck oncologic surgery. An aggressive approach to head and neck cancer management with curative intention can be also considered in high aged patients without a significant increase in mortality and complications.

**Key Words** head and neck cancer, elderly, general anaesthesia, therapy, prognosis

The increase of malignant tumours associated incidence together with mortality of elderly patients presents complex clinical problems regarding an increasing number of elder people in most countries of the world [1]. Hereby especially the treatment of those patients is concerned whose age has a decisive influence on their prognosis. The prognosis of patients with carcinomas of the upper aerodigestive tract is substantially determined by the localisation of the carcinoma, the tumour extent and particularly by the degree of lymphogenic metastatic spread. In geriatric patients this prognosis can additionally be influenced by age related factors. So pulmonary, cardio-vascular, renal, neural and endocrine functions are reduced by the ageing process<sup>[2]</sup>. Furthermore elderly patients can only cope difficultly with extreme strain. Complications concerning treatment are less tolerated and not rarely they are even lethal.

Among the different treatment concepts the surgical therapy of head and neck cancer is most important and often it is combined with radio(chemo)therapy<sup>[3]</sup>. The

planning of such a treatment concept in elderly patients is frequently determined by their advanced age, reduced physical and mental capacities as well as additional diseases [4]. So the advanced age itself is often associated with an incomplete diagnosis and a mild therapy [5,6]. Based on those co-morbidities and/or the conviction that the standard therapy would not be tolerated by this patient group, elderly people are excluded from a possibly curative therapy concept.

In the literature the term advanced age is not clearly defined. Patients are called old when they have accomplished 75 years. In geriatrics the patient group of advanced age are divided into a group of so-called young old patients (between 65 and 74 years old), older old patients (between 75 and 84 years old) and oldest old patients (over 85 years old)<sup>[7]</sup>. Because of the fact that the biologic age can diverge significantly from the chronological age the division of patients should not exclusively be based on the chronological age.

Despite frequency and clinical relevance only very few facts are known concerning the results and the tolerance of the therapy of head and neck cancer in old patients. This is especially true for local advanced carcinomas of the upper aerodigestive tract that are often discussed controversially. In many studies patients older than 80 years are scarcely considered. In view of this background and on the basis of published data from the literature results of surgical treatment in general anaesthesia concerning patients with head and neck cancer older than 80 years who are treated in our department

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shall be presented and discussed.

## MATERIAL AND METHODS

Since April 1998, 35 patients over the age of 80 with a malignant tumour of the head and neck area treated in the Department of Otolaryngology, Head and Neck Surgery of Philipps University Marburg, Germany were analyzed prospectively. In 6 patients because of a most severe concomitant life threatening disease an operation in general anaesthesia could not be performed or the patients declined surgery. In all other patients surgical treatment with curative intention was carried out in general anaesthesia, except for 2 patients who were treated in palliative intention. No emergency surgical procedures were performed. Sixteen of these patients were men and 13 were female with an average age of 84.5 years (range from 80 to 96 years). A total of 36 general anaesthetics were performed in these patients for cancer treatment.

All patients underwent detailed otolaryngological and anaesthesiological examinations preoperatively. Co-existent diseases and physical status of patients were documented. A careful preoperative preparation regarding mostly cardiac and pulmonary diseases as well as postoperative monitoring were performed in these patients. Postoperative morbidity and mortality is defined as that occurring within the first 30 postoperative days. The length of the operative procedure and hospitalization days were examined.

## RESULTS

All of these patients had major co-existent medical illnesses. Cardiovascular diseases including hypertension, cardiac failure, cardiac arrhythmia in all of the patients, chronic lung diseases in 7, diseases of the musculoskeletal system in 7, diabetes mellitus in 6, diseases of the nervous system in 4 and synchronous malignant diseases in 2 patients were documented. Following the American Society of Anesthesiologists classification of physical status (ASA classification, Table 1) all the patients

could be classified as operative risks as follows: 7 patients ASA 2, 18 patients ASA 3 and 4 patients ASA 4.

Squamous cell carcinoma was the most common malignant tumour in presented cases. One patient had two primary cancers of the head skin. Patients with squamous cell carcinoma of the upper aerodigestive tract (1 oropharyngeal and 6 laryngeal carcinoma) had a history of heavy alcohol and tobacco use. The localisation and histology of 30 tumours were presented in Table 2. Thirteen of all tumours were in UICC stage I, 5 in stage II, 3 in stage III and 9 in stage IV of neoplastic disease.

The surgical treatment included diagnostic endoscopy in 4 cases, cutaneous flaps for reconstruction of defects in skin of the head in 9 cases, 23 different types of tumour resections in head and neck region, one lymph node extirpation and 9 neck dissections (Table 3). The average length of general anaesthesia for these operations was 1.5 hours (range from 0.5 to 6.5 hours). No relevant blood loss in all surgical procedures could be mentioned. The number of days of hospitalization for all patients was in average 9.4 (range from 4 to 47 days).

For all surgical procedures local complications as postoperative hematoma were occurred in 2 patients undergoing modified radical neck dissection. In these patients coagulation disorders and a therapy with anticoagulants could be excluded. Other surgical complications could not be found. Only one patient received preoperative radiation and wound healing was not disturbed in this case.

Medical complications developed in one patient. She showed angina pectoris symptomatic and atrial fibrillation on seventh postoperative day. A severe coronary artery disease (ASA class 3) was known in this patient. All experienced complications could be treated rapidly. There was 1 death within 30 days of surgery for a mortality rate of 3.4% (1/29) in these series. This patient died of myocardial infarct on eighth postoperative day unrelated to his tumour. The preoperative ASA status of this 92 years old patient was class 4 with anamnesticly known chronic obstructive lung disease and cardiac failure.

**Table 1** Preoperative division of patients according to their physical condition (ASA classification; ASA = American Society of Anesthesiologists)

ASA	physical condition
ASA 1	healthy patient
ASA 2	mild systemic disease, no functional limitation
ASA 3	severe systemic disease, definite functional limitation
ASA 4	severe systemic disease that is a constant threat to life
ASA 5	moribund patient unlikely to survive 24 hours with or without surgery

**Table 2** Localisation and histology of 30 head and neck malignant tumours.

nr. of cases	localisation	histology
1	oropharynx	scc
1	thyroid gland	anaplastic carcinoma
6	paranasal sinus/ nasal cavity	1 esthesioneuroblastoma, 1 adenoid cystic carcinoma, 1 scc, 3 non-Hodgkin's lymphoma
7	major salivary glands	4 carcinoma, 3 parotideal lymph node metastases of a head skin scc
7	larynx	1 leiomyosarcoma, 6 scc
8	head skin	1 angiosarcoma, 7 scc/basal cell carcinoma

scc=squamous cell carcinoma

**Table 3** Types of surgical procedures.

operation	nr. of cases
lymph node extirpation	1
laryngotracheoscopy	1
Chordectomy (open surgery)	1
tonsillectomy	1
panendoscopy	3
tumour resection in paranasal sinus/ nasal cavity (endonasal or via lateral rhinotomy)	5
total/subtotal parotidectomy	7
extirpation of submandibular gland	7 (6 times by neck dissection)
endolaryngeal tumour resection	8
cutaneous flaps	9
neck dissection	9 (radical 1, modified radical 5, selective 4)

## DISCUSSION

People aged over 65 years present an increasing part of the population [8]. The risk of malignant tumours is highest in this age group [9,10]. The frequency of malignant tumours mounts nearly exponentially after the age of 40. About 50% of all malignomas occur beyond 65 years and about one third after 70 years. In view of the age distribution of the population it is not surprising that also most of the cancer related deaths concern patients aged more than 65[8,11,12].

Carcinomas of the upper aerodigestive tract represent about 5% of all primary manifestations of malignant tumours. Their incidence in Germany is estimated to amount to 15000 newly diagnosed diseases per year [13]. Squamous cell carcinomas of the upper aerodigestive tract mostly occur in the fifth and sixth decade. Less than 20% of those carcinomas appear after 75 years [14]. Tobacco and alcohol abuse are considered to be the main risk factors for the genesis of head and neck cancer [15]. Thus numerous patients suffer from extended sequel

diseases of a long-lasting tobacco and alcohol abuse as for example chronic emphysematous bronchitis, cor pulmonale, coronary heart disease, hepatocirrhosis, alcoholic cardiomyopathia and encephalopathia. In the present study all patients with squamous cell carcinoma of the upper aerodigestive tract had a history of heavy alcohol and tobacco use with chronic lung and coronary heart diseases. However, anamnestically a large number of elderly patients are not exposed to tobacco and alcohol, a fact that must not be neglected[16,17]. In those patients the age related accumulation of spontaneous mutations, a reduced effectivity of DNA reparation as well as a lower immunologic defense must be considered as the most important etiologic factors. This is proven by a reduced rate of p53 mutations in this age group whereas tobacco in other age groups leads to a significant increase of the rate of p53 mutations[14,18].

Geriatric patients miss to quickly find the diagnosis of a malignant process after the first occurrence of the symptoms. The reason for this is mostly the wait-and-see attitude assumed by the patient himself. However, also the diagnostic intention of the treating doctor must be considered a possible factor leading to a delay. The

arguments that are used in this context mostly refer to the high age, the age related reduced immunologic defense and the comparably low survival rate of those patients<sup>[19]</sup>. Because of cardio-vascular and pulmonary diseases, the fear of surgery associated mortality and postoperative complications, not rarely the treating specialists recommend an incomplete diagnostic and a mild palliative therapy for patients suffering from malignant tumours<sup>[20]</sup>. In contrary to such an attitude, other authors consider a complete staging for prognosis before treatment planning as obligatory, also in patients of advanced ages<sup>[21]</sup>. Routinely performed panendoscopies for tumour staging and the exclusion of a second carcinoma that occurs simultaneously in about 7 to 10% of the cases<sup>[22]</sup> should not be renounced to because of an advanced age. In some articles the authors were able to show that the frequency of multiple carcinomas is increased relatively to a higher age<sup>[14,23]</sup>. In patients of the present study 3 panendoscopies were performed in 1 oropharyngeal and 2 laryngeal squamous cell cancers without any sign for second carcinoma. One patient had two primary cutaneous carcinoma.

The renouncement to a curative treatment of the disease in elderly patients often leads to prolonged suffering of those patients and their hospitalisation and additionally the costs of the not rarely longer lasting palliative therapy become more intensive. Furthermore a therapy that is not initiated in time favours the regional metastatic spread which makes the prognosis of those patients even poorer<sup>[24]</sup>. Finally the progressive tumour growth in the area of the upper aerodigestive tract is accompanied by an increasing dysphagia and dyspnoea, by pains and a higher risk of tumour related bleedings. The progressing deterioration of the general health state leads to a higher risk of infections and cardio-pulmonary complications. So an adequate and possibly curative therapy is of high significance also in this age group.

For elderly patients suffering from an advanced carcinoma also an extensive therapy with curative outcome might be considered although some authors rather refuse an extended surgical therapy and estimate the age as an important prognostic factor<sup>[25-27]</sup>. Different study groups evaluated the prognosis of those patients after an extended surgical therapy as for example laryngectomy, laryngopharyngectomy, various free-flap reconstructions, neck dissection, partly combined with an additional radiotherapy<sup>[28-31]</sup>. Hereby no significant increase of the mortality rate together with an acceptable incidence of complications could be detected. Concerning the frequency of postoperative complications in patients past 70 that had undergone reconstruction with myocutaneous flaps, no statistically significant difference could

be shown<sup>[32,33]</sup>. The complication rate in elderly patients after microvascular free tissue transfer was considered as comparable to the one of a younger patient population<sup>[34]</sup>. Also the duration of the surgery had no influence on the complication rate in this age group. This factor is very important because in the treatment concept of this patient group the complex reconstructive surgical techniques are neglected in order to minimize the perioperative complication rate by reducing the surgical duration. The average duration of the general anaesthesia for different surgical procedures was 1.5 hours (range from 0.5 to 6.5 hours) in present cases without any relation to postoperative complications.

The incidence of postoperative complications in patients with carcinoma of the upper aerodigestive tract is relatively similar in all age groups whereas the type of complication differs dependently from the age. Elderly patients are mostly affected by pulmonary and cardio-vascular complications while in younger patients more often complications occur in the area of the operative access<sup>[35,36]</sup>. A correlation between already known diseases and postoperative complications could not clearly be proven for the group of elderly patients. So there are reports that cardiovascular and pulmonary complications do not occur more often in patients with anamnestically known cardio-pulmonary diseases<sup>[29]</sup>. Furthermore in the above mentioned studies no indication for a higher postoperative complication rate after radiotherapy could be found. While in some studies wound complications occurred frequently in already irradiated patients<sup>[37]</sup> other reports did not show any relation between wound complications and preoperative radiotherapy in the age group concerned<sup>[38,39]</sup>. In patients of the present study for all surgical procedures postoperative hematoma was occurred in 2 cases undergoing modified radical neck dissection. Other wound related complications could not be found. One patient showed angina pectoris symptomatic and atrial fibrillation on seventh postoperative day. One patient died of myocardial infarct on eighth postoperative day. The last 2 patients with cardiac complications had an anamnestically known severe coronar artery disease and cardiac failure (ASA 3 and 4).

Especially for malignant diseases in the head and neck region the advanced age should not represent a contraindication for an adequate surgical therapy<sup>[40]</sup>. Often an effective and timely treatment can lead to a higher life expectancy and to an improved quality of life. Progress in surgical and anaesthesiological techniques as well as improvements in the intra- and postoperative monitoring allow an optimised intraoperative survey of elderly patients. In order to treat geriatric patients effectively and well tolerably a careful preparation regarding

further mostly cardiac and pulmonary diseases is to be performed after an extensive preoperative staging<sup>[41]</sup>. Because of the mentioned reasons an individual medical and anaesthesiologic clarification regarding a possibly improved anaesthetic ability must be recommended<sup>[42,43]</sup>. Although there are no systematically evaluated data at disposition concerning the anaesthesiologic morbidity or mortality of elderly patients especially in tumour interventions in otolaryngology, general experience has proved to be valid also for the perioperative care of geriatric patients for these indications. Thus even in extended cardio-surgical interventions with help of the heart-lung-machine the perioperative mortality is not associated with the age but with the severity of the cardiac disease or with severe concomitant diseases.

Comparing the outcome of surgical interventions in general anaesthesia to elective surgical interventions in other fields, the field of otolaryngology has the lowest rate of perioperative mortality in the above mentioned age group<sup>[44,45]</sup>. After tumour excisions in this special field patients are able to achieve much faster their preoperative mobility. Normally a considerable shifting of fluids is not to be expected. Furthermore those surgical interventions are associated with only low risk of infections compared to other areas. Due to intact gastrointestinal absorption mechanisms the postoperative nutrition via stomach tube is possible. In case of tracheotomy the tracheo-pulmonary care can be performed.

Meanwhile it was possible to demonstrate that patients suffering from a carcinoma of the upper aerodigestive tract who are older than 75 have a significantly lower mortality and complication rate after curative

treatment than patients without undergoing curative therapy<sup>[46]</sup>. In a comparative study the 3-year-survival rate of both groups amounted to 77% versus only 18%<sup>[47]</sup>.

The 30 days mortality rate after head and neck cancer surgery evaluated in a literature research amounts to an average of approximately 5% in elderly patients (Table 4). Up to 50% of the causes of death are associated with pulmonary complications. The main cause of death is often not related to the oncologic disease or to therapeutic complications<sup>[54]</sup>.

## CONCLUSIONS

Improved preoperative preparation, the development of modern anaesthetics as well as the optimised perioperative monitoring were able to contribute significantly that the perioperative risk in elderly patients is not much higher because of the age alone. If the specifics of an advanced age are considered the indication for surgery and anaesthesia can be performed nearly independently from the age of the patient. For evaluation of the anaesthesiologic risk mainly the severity of concomitant diseases is the decisive factor.

In most of the evaluations for determining mortality and morbidity of elderly patients suffering from a carcinoma of the upper aerodigestive tract the necessary preconditions for such an analysis are not sufficient. So data concerning the co-morbidity of the patients often miss. Studies should be made that collect data of a comparable younger patient population with carcinomas of the same localisation and identical staging examination,

**Table 4** Mortality rate of patients suffering from head and neck cancer in advanced age within 30 days. Overview.

Author	year of publication	nr. of patients	minimum of age (years)	mortality (%)
Martin et al. <sup>[48]</sup>	1955	1129	60	1.3
Loewy & Huther <sup>[49]</sup>	1966	105	70	7.6
Ziffren & Hartford <sup>[44]</sup>	1972	?	70	5.9
Ziffren & Hartford <sup>[44]</sup>	1972	?	80	13.6
Williams & Mortagh <sup>[50]</sup>	1973	157	60	8.9
Johnson et al. <sup>[51]</sup>	1977	27	65	7
McGuirt et al. <sup>[52]</sup>	1977	162	70	7.4
Tucker <sup>[53]</sup>	1977	27	65	0
Trott et al. <sup>[42]</sup>	1982	25	70	0
Morgan et al. <sup>[45]</sup>	1982	810	65	3.5
Jun et al. <sup>[37]</sup>	1983	133	80	5.3
Harries & Lund <sup>[29]</sup>	1989	100	70	4
Shestak et al. <sup>[32]</sup>	1992	19	70	5.2
McGuirt & Davis <sup>[39]</sup>	1995	113	75	6
Shaari et al. <sup>[34]</sup>	1998	52	70	6
present study	2002	29	80	3.4

therapy, concomitant diseases and risk factors. However, despite all imperfections the results established up to now allow to draw the conclusion that an individual and adequate therapy of geriatric patients suffering from head and neck cancer can lead to satisfactory outcomes if a careful diagnostic indication is performed together with a specialist in anaesthesiology.

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