

Short communications

The influence of supportive nutritional therapy via percutaneous endoscopically guided gastrostomy on the quality of life of cancer patients

M. Senft¹, R. Fietkau¹, H. Iro², D. Sailer³, R. Sauer¹

¹ Strahlentherapeutische Universitätsklinik, Universitätsstrasse 27, D-91054 Erlangen, Germany

² Universitäts-Hals-, Nasen- und Ohren-Klinik, Waldstrasse 1, D-91054 Erlangen, Germany

³ Medizinische Klinik I der Universität, Krankenhausstrasse 12, D-91054 Erlangen, Germany

Abstract. Between April 1987 and May 1990 a total of 212 consecutive patients with tumours in the head and neck region were admitted to a prospective study comparing planned prospective enteral nutrition via percutaneous endoscopically guided gastrostomy (PEG; $n=47$) and oral nutrition ($n=134$). The nutritional status (anthropometric and laboratory chemical parameters) and the quality-of-life index according to Padilla et al. [Res Nurs Health 6:117–126 (1983)] were determined prior to radiotherapy, 2, 4, 6 weeks later during radiotherapy and 6, 12 and 18 weeks after completion of radiotherapy. The quality-of-life score of the orally nourished patients decreased quickly during radiotherapy and improved only slowly afterwards. Although PEG patients had a worse starting score, their quality-of-life index did not deteriorate during therapy (statistically significant difference between the two groups). The same applies to the nutritional status. These results show that an early and constant enteral nutrition by PEG can stabilize the nutritional state and the quality of life of patients with tumours of the head and neck area during radiotherapy.

Key words: Nutritional therapy – PEG – Quality of life – Cancer patients

Introduction

Nutrition is a vital function. In patients with head and neck tumours nutrition is especially impaired by cancer for tumour-, patient-, and therapy-related reasons

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Correspondence to: M. Senft

(overview Thiel et al. [24]), and 20%–50% of all tumour patients present with reduced nutritional status before any therapy starts. Mostly aggressive multimodal therapy is nonetheless necessary, which further worsens the nutritional status, and, in palliative situations, if there is no further option of treatment in advanced cancer, cachexia is the major cause of death.

Therefore supportive nutritional therapy has two objectives: first, to improve the nutritional status in patients suffering from tumour cachexia. Secondly, to prevent further deterioration due to therapy. At the University of Erlangen we prefer to use percutaneous endoscopically guided gastrostomy (PEG) for enteral nutrition.

In a prospective trial we studied the value of supplementary enteral feeding via PEG during and following radiotherapy of patients with tumours in the head and neck region. The principles of PEG implantation, its side-effects and nutritional education have been described in previous publications [6, 12, 19, 15] as well as the results of the different treatment modalities [7, 8, 16, 20]. Within the study population no relevant complications of PEG were observed.

Patients and methods

Patients

Between 1987 and 1990 212 consecutive patients were included in this prospective trial. All patients had histologically confirmed malignant tumours of the head and neck region and were treated with radiotherapy at the University of Erlangen. The age ranged between 22 and 79 years (median: 54.8 years); 180 (85%) were men and 32 (15%) were women; 134/212 (63%) patients fed themselves orally with normal diet or supplementary oral formula diets. Tumour classification was performed according to UICC [25]. In accordance with the protocol 47/212 (22%) patients received a PEG within 2 weeks after radiotherapy was started; 31

Table 1. Characteristics of patients ($n=212$): stage distribution and mode of nutrition. PEG, Percutaneous endoscopically guided gastrostomy; RT, radiotherapy

No. entered	(%)	Stage ^a	Treatment	No.	(%)
109	(54)	IV	PEG before RT	47	(22)
64	(32)	III	PEG during RT	31	(15)
20	(10)	II	No PEG	134	(63)

^a UICC [25]

Table 2. Quality-of-life questionnaire according to Padilla et al. [18]

1. General physical condition

How much pain are you feeling?
 How much nausea do you experience?
 How frequently do you vomit?
 How much strength do you feel you have?
 How much appetite do you have?

2. Important human activities

Are you able to work at your usual tasks?
 Are you able to eat?
 Are you able to obtain sexual satisfaction?^a
 Are you able to sleep well?

3. General quality of life

How good is your quality of life?
 Are you having fun?
 Is your life satisfying?
 Do you feel useful?
 Do you worry about the cost of medical care?^a
 Are you happy?^b

Answer:

Worst condition
X
 Normal for me

^a These questions had to be omitted because patients refused to answer

^b We substituted this question, provided by Padilla

(15%) patients received the PEG later and were therefore not included in this study (Table 1). In the following only the 134 orally fed patients and the 47 PEG patients are compared. A primarily planned randomized study was not feasible, because a large number of our colleagues were so impressed by the results of enteral PEG feeding that they provided the patients with a PEG even before radiotherapy was started. Randomization became impossible and the study was continued as an observation study.

Determination of the quality of life

The effects of enteral feeding via PEG on patients' quality of life was investigated by the questionnaire of Padilla et al. [18]. Originally this consisted of 14 questions (Table 2) concerning three main spheres of life: general physical conditions, normal human activities and personal expectations regarding general quality of life. Of the original 14 questions, 2 were refused by our patients: those regarding sexual satisfaction and medical costs. Therefore

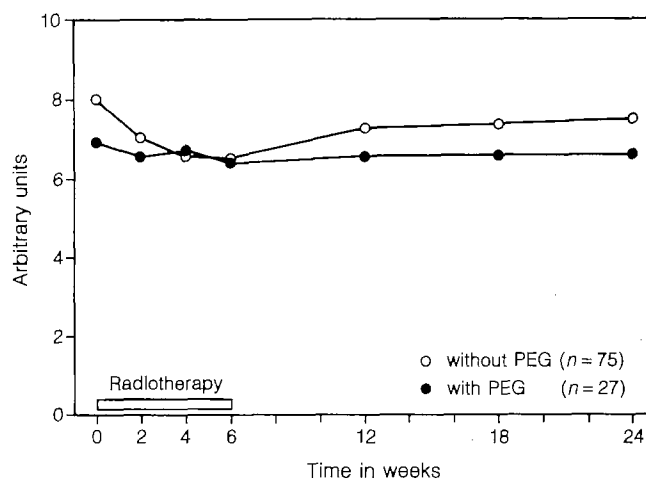


Fig. 1. Absolute values of the overall Padilla index representing quality of life before, during and after radiotherapy. For calculation see text

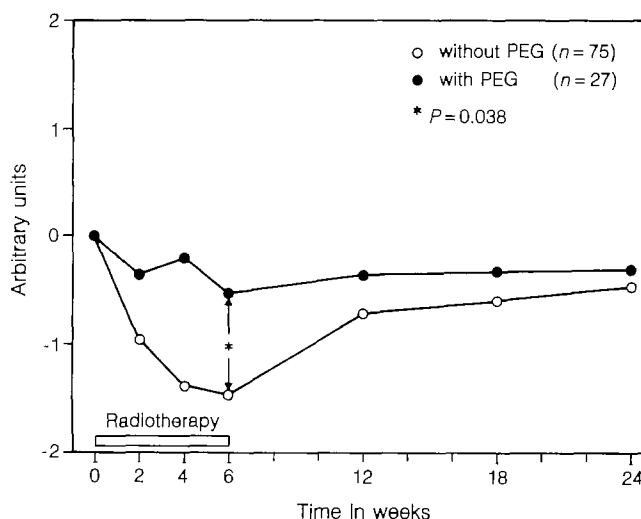


Fig. 2. Relative values of the overall Padilla index representing quality of life before, during and after radiotherapy. For calculation see text

they had to be omitted in the questionnaire used. Another question concerning "happiness" was added as provided by Padilla [18]. The patients answer the items by marking a cross on a 10-cm, undivided line, with "normal condition for me" at one end (point 10) and "worst condition" at the other (point 0). For evaluation one measures from the zero point to the cross to the nearest millimeter. The higher the number, the better the patient feels. The total index (Fig. 1) is calculated as the arithmetical mean of the values of the 13 questions. Altogether, 126/212 (59.5%) patients filled in the test correctly and on schedule. Excluding the patients receiving a PEG after 20 Gy irradiation, 81 patients with oral nutrition were compared with 28 patients with enteral nutrition via PEG.

Statistical analysis

Differences between the variables were determined using the *t*-test for unpaired samples. Differences with $P < 0.05$ were defined as significant.

Results

As for the objective parameters, body mass, triceps skinfold thickness, short-life visceral proteins etc., orally fed patients had markedly better initial values for their subjective quality of life before radiotherapy compared to the PEG patients (Fig. 1). For better comparison we finally converted the absolute into relative values; i.e. the values 2, 4, 6 ... weeks after the beginning of the study were subtracted from the initial value, which was defined as zero. Negative values show a decrease, positive ones an increase of the parameters. So, as underlined by the relative values (Fig. 2), during the radiotherapeutic course the values of the orally fed patients dropped by 10%–20%. By contrast the PEG patients' values remained constant during the treatment period. The difference after 6 weeks (endpoint of radiotherapy) is significantly different for the two groups. After completion of radiotherapy the values of the orally fed patients slowly recovered. The curves of the individual questions were in most cases similar to the total index.

Discussion

In recent years there has been growing interest in including assessment of the impact of disease and treatment on the functional psychological and social health of the patients [1, 14] in the evaluation of cancer treatment. Such investigations have mostly been performed with breast cancer patients [4, 13, 17], and those with lung cancer [9, 11], soft-tissue sarcomas [23] or prostate carcinoma [10]. Recently an EORTC core quality-of-life questionnaire and a diagnosis-specific module for head and neck cancer patients have been published [2], but concrete results of measuring quality of life during radiotherapy are still missing.

Our results of oral nutrition show a deterioration of quality of life parallel to the time course of the nutritional parameters. This is most pronounced in the questions concerning work, strength and appetite. By contrast, the questions of satisfaction and pain indicate only minor deterioration. With the help of enteral nutrition, according to the results of the nutritional status, there was no further deterioration of the quality of life-index. This means that, by effective nutritional therapy, these patients were able to keep their "normal" life style and to be integrated into their "normal" social milieu. Admittance to hospital because of deterioration of the nutritional status did not occur. Moreover the PEG tube is invisible to the public, an advantage compared with nasogastric feeding tubes, which stigmatize the patients.

The problems, instruments and concepts of measuring quality of life have been discussed extensively in the literature [1, 3, 5, 14, 21, 22], and a consensus has been reached that quality of life is a multidimensional concept and should include an evaluation of the physical, psychological and functional status together with an evaluation of social functioning. Questionnaires

filled in by the patients themselves are advocated as the most reliable means for obtaining information. The investigation should be repeated several times during and after therapy because quality of life, as shown by our results, is influenced by the tumour status, the treatment modalities, their side-effects and benefit. Therefore the time at which quality of life is measured is critical. Tests administered only once should be avoided.

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