

# Why Do Patients Drop Out During Radiation Therapy?

## - Analyses of Incompletely Treated Patients -

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**Purpose** : This study is to see how much proportion of the patients receiving radiation therapy drop out during radiation therapy and to analyze the reason for the incomplete treatment.

**Materials and Methods** : The base population of this study was 1,100 patients with registration numbers 901 through 2,000 at Department of Radiation Oncology, Samsung Medical Center, Seoul, Korea. Authors investigated the incidence of incomplete radiation therapy, which was defined as less than 95% of initially planned radiation dose, and the reasons for incomplete radiation therapy.

**Results** : One hundred and twenty eight patients (12%) did not complete the planned radiation therapy. The performance status of the incompletely treated patients was generally poorer than that of the base population, and the aim of radiation therapy was more commonly palliative. The most common reason for not completing the planned treatment was the patients' refusal of further radiation therapy because of the distrust of radiation therapy and/or the poor economic status.

**Conclusion** : Careful case selection for radiation therapy with consideration of the socioeconomic status of the patients in addition to the clinical indication would be necessary for the reduction of incomplete treatment, especially in the palliative setting.

**Key Words** : Radiation therapy, Incomplete treatment

## INTRODUCTION

It was estimated that approximately 60% of all

본 연구는 성균관대의대 삼성서울병원 임상연구비 보조에 의해서 수행되었다.

이 논문은 1998년 6월 5일 접수하여 1998년 7월 11일 채택되었음.

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cancer patients in the United States received radiation therapy.<sup>1)</sup> The corresponding figure in Korea was estimated to be about 30%.<sup>2)</sup> The principles of cancer management have changed according to the evolution of the fundamental concepts and technologies in basic and clinical medicine. More and more complex and sophisticated diagnostic and therapeutic modalities have been applied with more emphases on the

patients' quality of life issues in addition to the survival prolongation. The optimal ways of applying radiation therapy may be critical in the promotion of the patients' quality of life. The portion of the patients who do not complete the initially planned radiation therapy course is not small. This study intended to find the actual incidence of incomplete radiation therapy and to analyze the reasons.

## MATERIALS AND METHODS

The first radiation therapy was done in August 1994 at department of Radiation Oncology of Samsung Medical Center, and the base population of this study included 1,100 patients treated between the period of April 1996 and May 1997. In this study, authors investigated the incidence of the incomplete radiation therapy, which was defined as the premature termination of radiation therapy course before receiving less than 95% of initially planned radiation dose, and the reasons for the incomplete radiation therapy. Information was obtained by the review of the hospital records and the contact with the patients and their relatives by telephone or mail.

## RESULTS

The characteristics of total 1,100 patients are summarized in Table 1. Male to female ratio was 52% vs. 48%. The age ranged from 1 to 91 years and the median age was 54 years. The performance status scored using Eastern Co-

operative Oncology Group (ECOG) scale was 0 to 2 in 893 patients (81%), 3 to 4 in 196 patients (18%), and unknown in eleven patient (1%). About two-thirds (63%) of the total patient group were offered radiation therapy with the radical curative aims (including curative, post-operative, and prophylactic), while the rest one-third (37%) was with the palliative aim.

In 128 patients (11.6%), the radiation dose received was less than 95% of prescribed dose. The age and gender distributions were similar to those of the base population, while the performance status was poorer in the incomplete treatment group (Table 1). The aims of radiation therapy also were different between the base population and the incomplete treatment group: the palliative aim was in 37% of the base population, while it was in 66% of the incomplete treatment group. Forty of the incomplete treatment group (31%) received other treatment modality before the radiation therapy and 34 patients (27%) were offered radiation therapy as a part of the combined treatment modality.

The prescribed radiation dose ranged from 400 cGy (for prophylactic irradiation of leukostasis) to 7,020 cGy (for head and neck cancer), and the fraction size ranged from 120 cGy to 500 cGy. The actually given dose ranged from 0 cGy to 5,600 cGy, and 70 patients (55%) received less than 50% , while 127 patients (99%) received less than 90% of the prescribed dose. Supportive care only was given without further treatment after the cessation of radiation therapy in 92 patients

Table 1. Characteristics of the Patients

Characteristics	Base population (n=1100)	Incompletely treated patients		
		Total (n=128)	Curative aim (n=43)	Palliative aim (n = 85)
Age (median age)	1-91 (54 years)	1-91 (60 years)	9-82 (62 years)	1-91 (61 years)
Male : Female (%)	52:48	69:31	70:30	68:32
Performance status (ECOG scale)				
0-2	81% (893)	66% (84)	93% (40)	52% (44)
3-4	18% (196)	34% (44)	7% ( 3)	48% (41)
Unknown	1% ( 11)	0% ( 0)	0% ( 0)	0% ( 0)

Table 2. Reasons for Incomplete Treatment

Reasons	Frequency (%)		
	Total (N=128)	Curative aim (N=93)	Palliative aim (N=85)
Patients' refusal	30 (23.4)	15 (34.9)	15 (17.6)
Deterioration of general condition (unrelated with primary disease status)	24 (18.8)	7 (16.3)	17 (20.0)
Progression of disease	22 (17.2)	4 ( 9.3)	18 (21.2)
Death	17 (13.3)	2 ( 4.7)	15 (17.6)
Side effects of radiation therapy	13 (10.2)	8 (18.6)	5 ( 5.9)
Other treatment modality	12 ( 9.4)	3 ( 7.0)	9 (10.6)
Transfer to other hospital close to patients' residence	9 ( 7.0)	4 ( 9.3)	5 ( 5.9)
Unknown	1 ( 0.8)	0 ( 0 )	1 ( 1.2)

(72%), while the rest of the patients received surgery, chemotherapy, radiation therapy or combined chemoradiotherapy .

The reasons for the incomplete treatment were shown in Table 2. The patients' refusal of radiation therapy was the most common reason. It was usually because of the patients' distrust of radiation therapy or the poor economic status. The second most common reason was the deterioration of the patients' general condition. Other reasons included the progression of disease, the patients' death, the side effects of radiation therapy, the change of treatment plan to use other modality, and the transfer to other hospitals that were close to the patients' residences.

## DISCUSSION

Ionizing radiation has been more and more frequently utilized in cancer treatment. Recent advances in radiation therapy include the development of the treatment machines producing the high-energy photons and electrons with guaranteed accuracy and precision, the sophisticated computerized treatment planning systems, and the accessory systems that help the reliable and reproducible radiation delivery. Recent data indicate that about half of all the cancer patients may need to receive radiation therapy during their treatment courses. Radiation therapy has played a major role in the cancer management not only as a curative modality but also as a tool for the symptom palliation or prevention. The quality of

life issues have been increasingly referred to as an outcome parameter in the clinical trials, the benefit-risk analyses, and the quality-of-care assessments. As the medical insurance system has become more and more concerned about the cost of the high-technology treatment modality, a few legitimate questions have arisen. For example, investigators are trying to find the appropriate ways to formulate the quality of life issues, which should be evaluated subjectively by the patients, with the concepts of the total benefits and costs. In this context, the costs of care will be the most problematic if the care given is evaluated as "futile" or "marginal".<sup>3)</sup>

## CONCLUSION

There has been little data available about the incidence of the incomplete radiation therapy, which usually depends on the socioeconomic status of the patients. In this study, the incidence of the incomplete treatment was over 10%. The most common reasons for the incomplete treatment were the patients' refusal after the treatment commencement, the deterioration of the patients' general condition unrelated with the primary disease status, and the progression of disease. Careful case selection for radiation therapy with consideration of the socioeconomic status of the patients as well as the clinical indication would be necessary for the reduction of incomplete treatment, especially in palliative setting. Authors also assume that the patients' thorough understanding

of the nature of diseases, the treatment procedures, and the side effects would be necessary to reduce the incidence of the incomplete treatment and the inconvenience incurred to both the care-givers and the care-receivers. This could be realized through the thorough pretreatment evaluation of the patients' general health status and the discussion between the radiation oncologists and the patients and their relatives, which might be more time-consuming and pains-taking.

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= 국문 초록 =

## 불완전 방사선치료 환자의 분석

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**목적 :** 본 연구는 계획된 방사선치료의 과정 도중에 방사선치료를 완료하지 못하는 환자들의 빈도를 조사하고 그 이유를 분석하고자 하였다.

**대상 및 방법 :** 삼성서울병원 치료방사선과에서 방사선치료를 받은 환자 중에서 1996년 4월부터 1997년 5월까지 방사선치료를 시행 받은 1,100명의 환자들을 대상으로 하였다. 대상 환자들 중에서 최초 계획 방사선량의 95% 이하를 받은 경우를 불완전 방사선치료로 정의하여 그 빈도와 이유를 조사하였다.

**결과 :** 불완전 방사선치료의 빈도는 1,100명 중 128명으로 12%였다. 불완전 방사선치료 환자들의 운동수행능력은 전체 환자들에 비하여 불량하였으며, 방사선치료의 목적은 고식적 목적이 많았다. 불완전 방사선치료의 가장 흔한 이유는 환자의 거부였으며 이는 주로 환자의 방사선치료에 대한 불신과 경제적 부담 때문이었다.

**결론 :** 불완전 방사선치료의 빈도를 줄이기 위해서는 방사선치료의 임상적 적응 여부는 물론 환자의 사회 경제적 여건을 잘 고려하여 방사선치료의 대상 환자를 선정하는 것이 요망되며 이는 특히 고식적 방사선치료의 경우에 더욱 중요하다고 할 수 있겠다.