

가 * , † , ‡ , §
* § . * . * . * . * . § . † . ‡

가
: 1999 7 2000 3
33 13
가 12 , 가 1 44 66 (:59)
10 825 cc (: 185 cc) . 1 3 5 Gy 90%
3-5 , 2 3 30 50 Gy 50 Gy .
: 3 13 (: 8) .
7.7% , 53.8% , 30.8% , 7.7% (+)
61.5% . AFP , 92.3% AFP
가 84.6% , 69.2% , 가
15.4% , 7.7% .
:

: ,

6 11)

가

90%

가

1951 Leksell¹²⁾
1990

1998

Lax^{13, 14)}

10

20

1)

가

가

가

가

가

가

2 5)

16 18)

가

가

1999 7 2000 3

2000 12 7 2001 3 15

33

13

Tel: 055)750-8217, E-mail: jsk92@nongae.gsnu.ac.kr

가
 AFP , (gold marker, 1×3 mm)
 5 mm
 가 12 , 가 1
 44 66 (:59) X, Y, Z
 10 825 cc (: 185 cc)
 10
 11 , 3 (NMPE 3D RTP,
 , 가 Seattle, USA) 3
 6 MV 가 1 3 5
 Gy 90% 3 5 , 2 3
 30 50 Gy
 (:50 Gy).
 3 ISOLOC (Isocenter localization program, NMPE, seattle, USA)

'Point Reference System (Northwest Medical Physics Center, Seattle, USA)'
 (Fig. 1).¹⁵⁾ micropositioner (TORSO system, NMPE, seattle, USA) 가

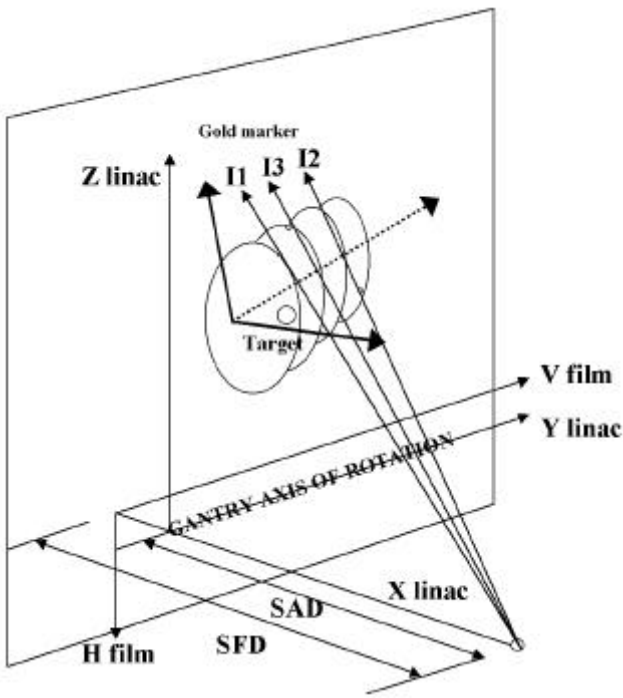


Fig. 1. Coordinate of Point Reference System '

가 5 mm
 1 2 3
 (complete regression, CR), 가 50%
 (partial regression, PR),
 가 25 50% (minor regres-
 sion, MR), (no response, NR)
 AFP
 8 (:3 13). 13
 11 2
 . 1 3
 1

Table 1. Summary of Primary Hepatoma Treated with SRT

No	Age	Sex	Tumor site	Tumor Vol* (cc)	SRT† (TD‡/Fx§/Wk)	Response	F/U¶ (month)	Disease status
1	61	M [#]	Left lobe	137	50/10/2	MR ^{§§}	13	A&D ^{¶¶}
2	52	M	Left lobe	825	30/10/2.5	NR	5	DOI [#]
3	60	M	Right lobe	38	50/10/2.5	PR ^{‡‡}	13	A&D
4	58	M	Left lobe	25	50/10/2	CR ^{††}	12	NED ^{***}
5	61	M	Left lobe	149	50/10/2	MR	12	A&D
6	44	M	Left lobe	640	30/10/3	MR	3	DOM ^{†††}
7	65	F ^{**}	Left lobe	15	50/10/2	PR	9	A&D
8	66	M	Right lobe	66	50/10/2	PR	8	A&D
9	55	M	Right lobe	55	50/10/2	PR	8	A&D
10	60	M	Left lobe	60	50/10/2	PR	8	A&D
11	65	M	Left lobe	135	50/10/2.5	MR	7	A&D
12	59	M	Left lobe	182	50/10/2.5	PR	5	A&D
13	61	M	Left lobe	80	50/10/2	PR	5	A&D

*volume, †stereotactic radiation therapy, ‡total dose, §fraction, week, ¶follow-up period, # male, **female, ††complete regression, †††partial regression, §§§minor regression, no response, ¶¶¶alive with disease, ##death of intercurrent disease, ***No evidence of disease, ††††death of metastatic disease

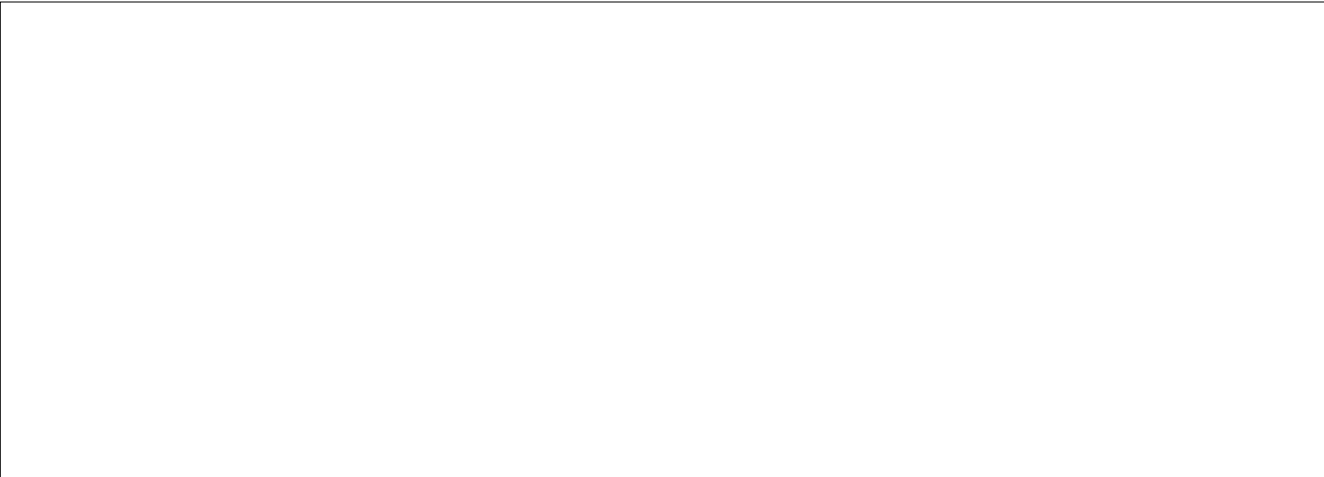


Fig. 2. (a) Abdominal CT scan was taken from fifty-eight year-old man with 25 cc mass on left lobe and cirrhosis in the liver as diagnosed hepatoma. Serum AFP was 25 ng/ml before the treatment. Stereotactic radiotherapy (SRT) was done with 50 Gy/ 10 fractions for two weeks. (b) One month after SRT, the hepatic mass was decreased (PR state) and serum AFP was also dropped to 8 ng/ml. (c) Three months after SRT, the abdominal CT scan did not show any evidence of tumor mass as clinically confirmed CR state and serum AFP was reduced to 6 ng/ml.

(Fig. 2). AFP
, 92.3% (12/13)

(Fig. 3).

5
7.7% (1/13), 53.8% (7/13), 가 84.6% (11/13),
30.8% (4/13), 7.7% (1/13) (69.2% (9/13), 가 15.4% (2/13),
+) 61.5% (8/13) (Table 1). 1 7.7% (1/13) .
가 3
9

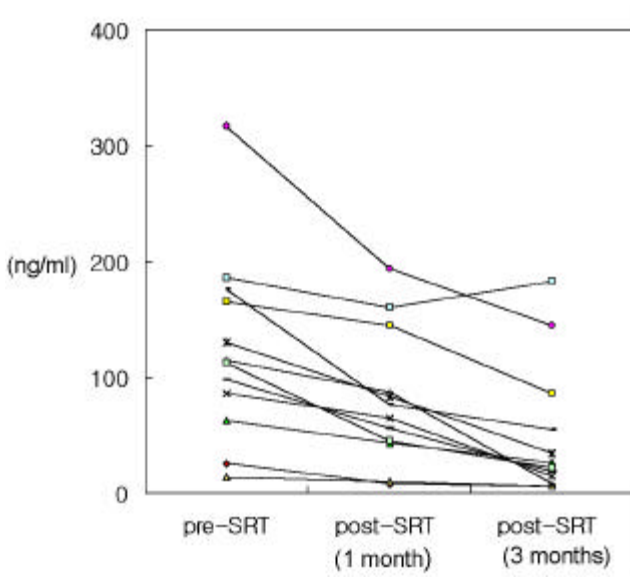


Fig. 3. Serum AFP level before and after SRT.

6 :
 2
 3 가
 가 . 3
 가
 , ,
 Lax^{13, 14)} 1990
 ,
 1995 Blomgren¹⁷⁾ 8
 12 8 30 Gy 1 3
 16 66 Gy . 2
 10 가 2 가
 5 cc, 15 cc 3 22
 3 가 5 가
 가
 . 1998 Sato¹⁸⁾ 가
 가 3.5 cm . 18 23
 80 %
 5 10 , 1 2 50 Gy 100%
 ,
 61.5% (8/13)
 150 cc
 5 cm
 AFP Sato¹⁸⁾ 18 6
 가 1 3
 AFP
 AFP
 92.3% (12/13) AFP
 1
 가
 가
 66.7%
 24
 11)

가

AFP

가

Blomgren ¹⁷⁾

(38.5)

가

가

가

가

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Abstract

**Preliminary Result in Patients with Primary Hepatoma
Treated by Stereotactic Radiotherapy**

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Purpose : It is not common to evaluate the response of the fractionated stereotactic radiotherapy (SRT) to primary hepatoma as compared with conventional radiotherapy. The purpose of the study was to take the preliminary result on the clinical trial of primary hepatoma by SRT.

Materials and Methods : From July 1999 to March 2000, thirty three patients were hospitalized in the St. Mary's Hospital, and treated with SRT for extracranial tumors. Among them, 13 patients were diagnosed to primary hepatoma and then applied by frameless SRT using 6 MV linac accelerator. There were 12 male and 1 female patients. They had the age of 44 - 66 year old (median : 59) and the tumor size of 10 - 825 cc (median : 185 cc). SRT was given to them 3 - 5 fractions a week (5 Gy/fraction, 90% isodose line) for 2 - 3 weeks. Median dose of SRT was 50 Gy and the range was 30 - 50 Gy.

Results : Follow-up period ranged from 3 months to 13 months with median of 8 months. After treating SRT to thirteen patients with primary hepatoma, the response of the tumor was examined by abdominal CT : they are classified by 1 complete regression (7.7%), 7 partial regression (53.8%), 4 minimal regression (30.8%), 1 stable disease (7.7%). The positive responses more than partial remission were 8 patients (61.5%) after the treatment. The level of serum alpha-fetoprotein (AFP) after the treatment as compared with pretreatment had been 92.3% decreased. There was no severe complication except dyspepsia 84.6%, mild nausea 69.2%, transient decreased of hepatic function 15.4% and fever 7.7%.

Conclusion : SRT to the patients with primary hepatoma was potentially suggested to become the safe and more effective tool than the conventional radiotherapy even though there were relatively short duration of follow-up and small numbers to be tested.

Key Words : Primary hepatoma, Stereotactic radiotherapy