

국소 방사선장해의 진단 및 치료

Diagnosis and Treatment of Local Radiation Injury

2 215 - 4

Chul Koo Cho, M.D.

Department of Radiation Oncology

Korea Cancer Center Hospital

E - mail : chcho@kcch.re.kr

Abstract

The prognosis and medical handling of individuals exposed to external radiation depend upon whether the whole body has been exposed, or the exposure was localized. It is very important for the prognosis and choice of treatment to know how the absorbed dose has been distributed within the body. The dose distribution depends on the condition of exposure and the circumstances of the accident. Local radiation injury (LRI) is much more frequent than whole body exposure (WBE) and hence described in detail in a variety of literature. LRI caused by high doses of radiation ($\geq 8\sim 10$ Gy) produces signs and symptoms similar to a thermal burn except for the striking delay in the onset of clinical changes, from several days to a week or longer. The severity of LRI depends not only on the dose and type of radiation, but also on the location and size of the area exposed. In general, the higher the dose received, the more rapid the development of pathological symptoms and the more severe the prognosis. Therefore, diagnosis and prognosis should be based upon various parameters, besides the clinical observation, such as dosimetry, reconstruction of the accident, thermography, scintigraphy, etc.

Keywords : Localized radiation injury;
Biological dosimetry;
Physical dosimetry;
Medical treatment;
Surgical treatment

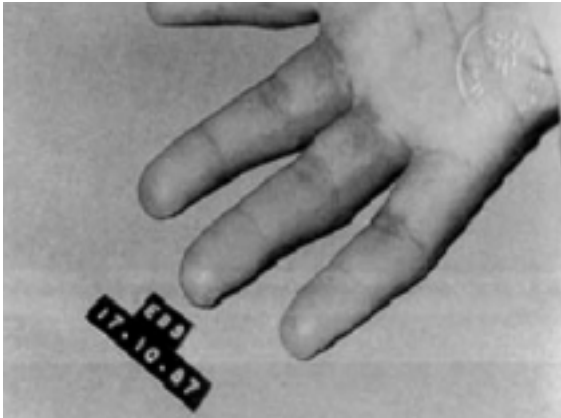
가 .
.
.
(source) 가
,
,
, 가
, 가
가
.
가
,
(dose distribu-
tion) 가
가

가
가
(dose rate)
()

1.	
(Gy)	()
3'~'10	14'~'21
≥ 3	14'~'18
8'~'12	25'~'30
15'~'20	20'~'28
15'~'25	15'~'25
≥ 20	14'~'21
≥ 25	≥ 21

X
(Local Radiation Injury, LRI)
가
가 (1). 8 10 Gy
가 , Gy
24 . 8 Gy
가 가
(2). 3가
1
가

1.
(subcutaneous tissue)
가
가
가 ,
가
1 가 X
(secondary erythema)
2 3 (dry),
(moist desquamation)가
(delayed)
2 4
(3, 4).



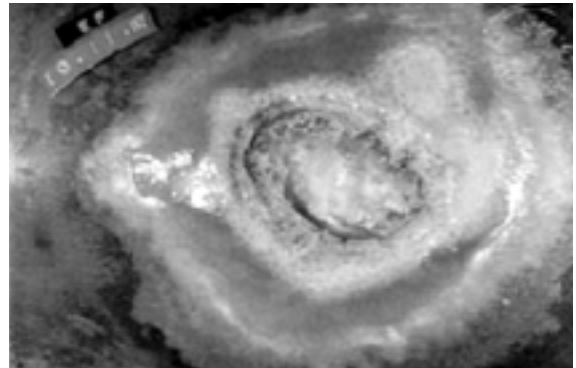
1. 3 가



2. 17 가



3. 30 가



4.

가

(vesicle)

(bulla)

10 Gy

2 3

가

가

(hyaline fluid)

3

(1, 2).

(threshold dose)

12 Gy

가

25 Gy

(5).

4

6

30



5. 75 .



6. 75 . 가 가

50 Gy

(3),

(4),

(5).

가

(fibroblast)

(collagen)

, 가

(ankylosis)

(deformity)

(6).

1987 9

- 137

(Goiania)

- 137

27가

(phase)

(6).

thelitis)

(vascular endothelitis)

(exudative epi-

가

4

(, ,

).

8 12

,

가

가

가

가

(7).



7. 1 6 가

2.

tron spin resonance(ESR)

1

가

sis)

(erythrocyte sedimentation rate)

가(leucocyto-

가

5 ~ 10 Gy

(chromosome aberration)

가

가

(thermography)

가

telethermovision

가

가

$^{99}\text{Tc}^m$ pertechnetate

(scintillation

camera)

가

가

(hair cortical cell)

(indicator)

3.

가

가 . , .

(7, 8).

가

1)

가 .

가 . (Aloe vera) - E (pulsatile) , (Acemannan) (keratinocyte) 가 II - 1, II - 6 (Tumor Necrosis Factor, TNF) 가 가 가 (superoxide dismutase) (11).

(extradural anesthesia)가 (9, 10). cortisone Hydro- (spray) (moist desquamation)

(opioid)가

가
(occlusive dressing)

가

가

가
mal growth factor)
(12).

(epider-

가

(nafthydrofuril)

(pedicle graft)

가

(pentoxifylline)
(viscosity)

가

(hyperbaric oxygen therapy)

가

가

(boric acid solu-

2)

(13)

tion)

가

(vesicle)

가 (gause)

가

가

가

- well JW. Biological effects of irradiation on skin and re-

- commended dose limits. Radiat Prot Dosim 1991 ; 39 : 11 - 24
4. Hopewell JW. The skin, its structure and response to ionizing radiation. Int J Radiat Biol 1990 ; 57 : 751 - 73
5. Oliveira AR, Brandao - Mello CE, Valverde NJL, Farina R, Curado MP. Localized lesions induced by Cs - 137 during the Goiania accident. Health Phys 1991 ; 60 : 63 - 6
6. Oliveira AR, Valverde NJL. Skin lesion associated with Goiania accident, II : Clinical experience and follow - up since 1979. In : The medical basis for radiation accident preparedness. New York : Elsevier North Holland, 1990 : 95 - 100
7. Nenot JC. Medical and surgical management of localized radiation injuries. Int J Radiat Biol 1990 ; 57 : 783 - 95
8. Gongora R, Magdelenat H. Accidental acute local irradiations in France and this pathology. British Journal of Radiology 1986 ; 19(supple) : 12 - 5
9. McQuai HJ. Opioids in chronic pain. Brit J Anesthesiology 1989 ; 63 : 213 - 26
10. Budd K. Recent advances in the treatment of chronic pain. Brit J Anesthesiology 1989 ; 63 : 207 - 12
11. Nenot JC. Clinical management for localized overexposure. J Soc Radiol Prot 1985 ; 5 (1) : 55 - 8
12. Mertz PM, Eaglstein WH. Treatment of radiation injuries. New York : Plenum Press, 1990 : 165 - 74
13. Ross JP, Holly FE, Zarem HA. The medical basis for radiation accident preparedness. New York : Elsevier North Holland, 1980 : 205 - 21
14. Robinson DW. Surgical problems in the excision and repair of radiated tissue. Plastic and reconstructive surgery 1975 ; 5 ; 41 - 9
15. Stern PJ. The medical basis for radiation accident preparedness. New York : Elsevier North Holland, 1980 : 257 - 63
16. IAEA. Dosimetric and medical aspects of the radiological accident in Goiania in 1987. Vienna : IAEA, 1998 : 70 - 81

* : 3 , 5 , 1 , 2
 * () : 2 , 5 , 1
 * :



가

: [140 - 721]

1 302 - 75

Tel. 02-794-2480, 6587, 2474(ARS 8) Fax. 02-792-1361

‘ ’