



: (RDS)  
 가  
 : 4  
 78 ( 840-3600gm; 1682gm, 20-38 ;  
 31 )  
 1-12 ( 5 ) 1  
 12  
 (1 ), (2 ), (3 ) ,  
 ( , , ),  
 .  
 : 78 46 (59%) 32 (41%)  
 . 1 57 38 (67%), 2 13 6 (46%), 3  
 8 2 (25%) (p  
 < 0.05). 가 (p > 0.05).  
 ( ; 17 , ; 13 , ; 5 ) 24 10  
 (42%) 54 ( 36 , 67%)  
 (p<0.05). 1 12 (21%), 2 6 (46%), 3 6  
 (75%) (p<0.05). (n = 12), 3  
 (n = 7), (n = 17) 11 (92%), 7 (100%), 7 (41%)  
 .  
 :  
 .  
 가  
 가 (1, 2).

가  
 가  
 1996. 1 1998. 12 3  
 (3-8).

가 117  
 78 ( 47 ; 31 , 840-  
 3600gm; 1682gm, 20-38 ; 31 )  
 .  
 1-12 ( 5 )  
 1999 8 31 2000 3 17  
 833

가 ( 1 ),

chi-squared test, p

(Surfacten; (warm N/S) 120mg/ 4ml (cut-down tube) (neutral), (right head up), (right head down), (left head up), (left head down) (ambu bagging) , Apgar , 4 (grade) (9).

(endotracheal suction) , 13 (17%), 3 8 (10%) 1 38 (67%), 2 6 (46%), 3 2 (25%) (p < 0.05) (Fig. 1, 2) (Table 1).

가 54 5 (1-12 ) . 3 (n = 14), 3 6 (n = 22), 6 12 (n = 18) 6 (43%), 15 (68%), 13 (72%)가 (p < 0.05). (Fig. 3A, 3B) 24 ( 17 , 13 5 ) 10 (42%) (54 , 36 , 67%) (p < 0.05) (Table 2).



A  
Fig. 1. A premature female newborn of 35 week gestational age.  
A. Pre-surfactant radiograph shows bilateral diffuse haziness with air bronchogram (stage III).  
B. Post-surfactant radiograph 2 hours after surfactant replacement shows bilateral symmetrical aeration. She survived without pulmonary complication.

10 6 1 12 (21%), 2 6 (46%), 3 6 (75%) (p < 0.05) (Table 3). 78 1 (n = 6), 2 (n = 5), 3 (n = 4), 4 (n = 3) 67% (4), 40% (2), 100% (4), 100% (3) (n = 7) (12) (Fig. 3C), (17) (20) 11 (92%), 7 (41%), 6 (30%)

4-6 60

Table 1. Survival Rate According to the Radiographic Improvement Pattern

Group	No. (%)	Survived	Survival Rate (%)
1	57 (73)	38	67
2	13 (17)	6	46
3	8 (10)	2	25
Total	78	46	

p < 0.05

group 1; uniform bilateral improvement  
group 2; asymmetrical unilateral improvement  
group 3; no improvement

가 shake test (1). Rh- 가 (11). (3-8).

Table 2. Barotrauma and Survival Rate

B \ S	Survival	Death	Total
Present	10	14	24
Absent	36	18	54
Total	46	32	78

p < 0.05

B: barotrauma, S: survival

Table 3. The Incidence of Barotrauma According to the Improvement Pattern

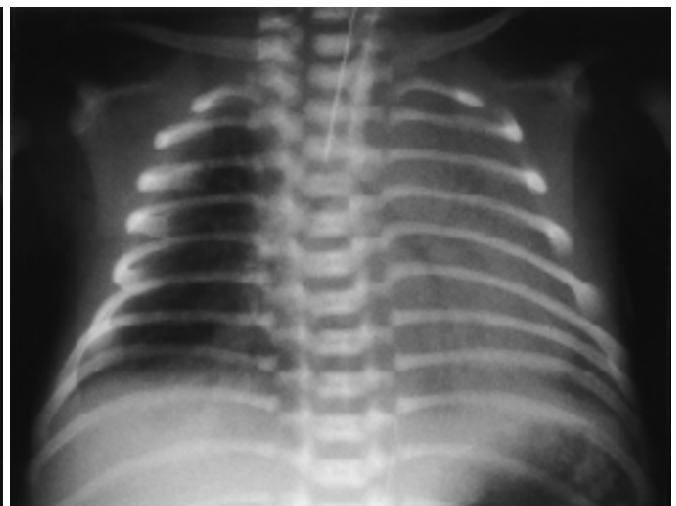
G \ B	Present	Absent	Total
1	12	45	57
2	6	7	13
3	6	2	8
Total	24	54	78

p < 0.05

G: group, B: barotrauma  
group 1; uniform bilateral improvement  
group 2; asymmetrical unilateral improvement  
group 3; no improvement



A



B

Fig. 2. A premature male newborn of 35 week gestational age  
A. Pre-surfactant radiograph represents bilateral diffuse opacity with obliteration of cardiac silhouette (stage IV).  
B. Post-surfactant radiograph 2 hours after surfactant replacement shows unilateral aeration of right lung. He survived with intermittent positive pressure ventilation

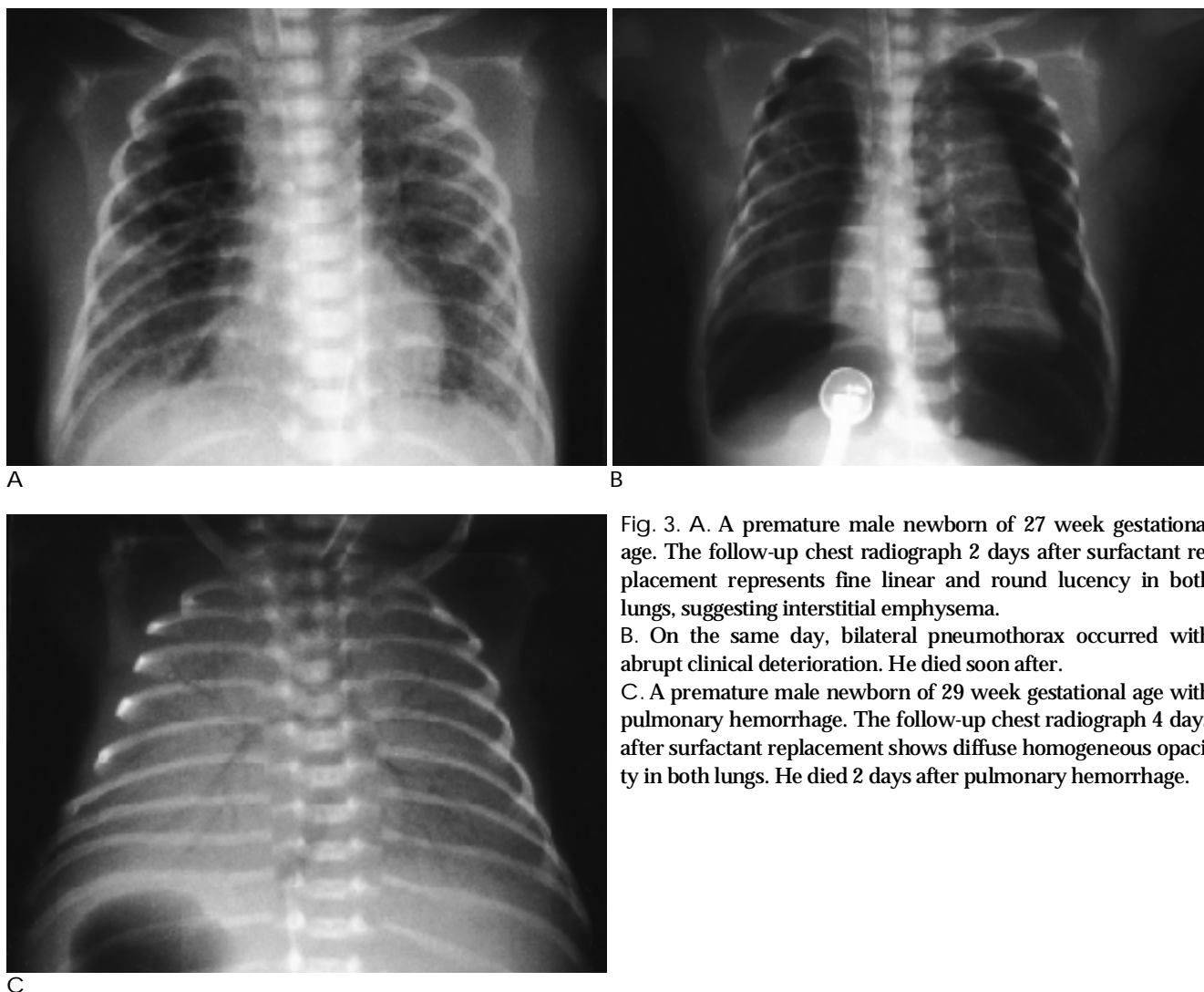


Fig. 3. A. A premature male newborn of 27 week gestational age. The follow-up chest radiograph 2 days after surfactant replacement represents fine linear and round lucency in both lungs, suggesting interstitial emphysema. B. On the same day, bilateral pneumothorax occurred with abrupt clinical deterioration. He died soon after. C. A premature male newborn of 29 week gestational age with pulmonary hemorrhage. The follow-up chest radiograph 4 days after surfactant replacement shows diffuse homogeneous opacity in both lungs. He died 2 days after pulmonary hemorrhage.

tion due to malpositioned endotracheal tube) (3, 13), (14), (regional difference of aeration) (15, 16) (disproportionate aeration) 3-5 (6). (pulmonary air leak) (6-8). (6). 1 2 (n = 3), (n = 2), (n = 6) Wolfson (12) (p < 0.05). 1 2 73% (stage) 17% 67% 46% 95% 85% Dinger (6) (maldistributed) Gortner (19) 1 2-6 (modified natural surfactant) (protein-free synthetic surfactant) (17, 18).

가 blood) 12 11 (92%)가 8

1 12

5 3 , 3 6

, 6

12

가

가

가

가

5% CPAP(continuous positive airway pressure) 10-15% IPPV(intermittent positive pressure ventilation) PEEP(positive end-expiratory pressure) 20-40% (20).

(21-24).

가 (p < 0.05),

24 14 (p < 0.05).

Dinger (6)

19 14 (74%)가 1

가

53% 84%가

7 ,

10 4 , 5 가 53%가

(n = 3) 13

(n = 4)

(n = 6)

(n = 4) 3

(n = 1)

2 가 (25)

(20, 26).

HFOV (high frequency oscillatory ventilation) (27, 28).

40% (29).

3 4

18 7 3

(30).

(tracheal suction) (fresh

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## Respiratory Distress Syndrome: Comparison between Radiographic Finding after Surfactant Replacement Therapy and Prognosis<sup>1</sup>

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**Purpose:** To evaluate the relationship between radiographic findings after surfactant replacement therapy and prognosis in newborns with respiratory distress syndrome (RDS).

**Materials and Methods:** The chest radiographs and medical records of 78 infants [body weight 840-3600g, mean 1682g, gestational age 20-38 (mean, 31) weeks] who had been treated with surfactant were retrospectively analysed. Surfactant was applied 1-12 (mean, 5) hours after birth. By comparing pre-and post-surfactant radiographs, radiographic changes were graded as either uniform bilateral improvement (grade 1), asymmetrical unilateral improvement (grade 2), or no improvement (grade 3). Complications such as barotrauma, bilateral diffuse consolidation, or intracranial hemorrhage were tabulated. We correlated the prognosis with (a) the radiographic improvement pattern, (b) the time of surfactant application, and (c) the incidence of pulmonary complications, respectively.

**Results:** Forty-six (59%) of 78 infants survived, and 32 (41%) died. The survivors comprised 38 infants in group 1 (67%, n= 57), six in group 2 (46%, n= 13), and two in group 3 (25%, n= 8) ( $p < 0.05$ ). The survival rate did not correlate with the time of surfactant application ( $p > 0.05$ ). Infants with barotrauma had a lower survival rate (42%, 10/24) than those not suffering from this condition (67%, 36/54) ( $p < 0.05$ ). The condition occurred in 12 (21%) of 57 infants in group 1, six (46%) of 13 in group 2, and six (75%) of eight in group 3 ( $p < 0.05$ ). Eleven(92%) of 12 infants with pulmonary hemorrhage, seven (100%) of seven with intracranial hemorrhage above grade 3, and seven (41%) of 17 with sepsis died.

**Conclusion:** The radiographic changes occurring after surfactant replacement therapy correlated closely with the incidence of barotrauma and the prognosis of newborns with respiratory distress syndrome. Close observation of follow-up radiographic findings plays an important role in therapy and prognosis.

**Index words :** Thorax, radiography  
Respiratory distress syndrome  
Surfactant

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