

가토(家兔)에서 일측성 횡격막 마비가 폐혈류량에 미치는 영향

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Effect of Unilateral Diaphragmatic Palsy on Lung Perfusion in Rabbit Model

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ABSTRACT

Background : In congenital heart disease, the lung perfusion through stenosed pulmonary artery is usually decreased. And this decrement of lung perfusion also occurs with diaphragmatic palsy after the operation of congenital heart disease. It is difficult to delineate the amount of lung perfusion in case of combination of pulmonary artery stenosis and diaphragmatic palsy. We examined the change of lung perfusion after the induction of diaphragmatic palsy in rabbits. **Methods :** We dissected left phrenic nerves in 20 rabbits to induce left diaphragmatic palsy. The lung perfusion scan was performed with ^{99m}Tc -MAA and the movement of diaphragm was examined with fluoroscopy. They were performed as baseline data and on 3rd and 10th day postoperatively. The amount of left lung perfusion before and after diaphragmatic palsy was compared and analysed in 12 rabbits which definitely had diaphragmatic palsy. **Results :** Weight of the rabbits was 1.65 ± 0.26 kg. Left lung perfusion percent was $45.93 \pm 6.42\%$ before operation and these were $32.48 \pm 6.09\%$ and $37.62 \pm 3.39\%$ on the 3rd and 10th postoperative day, respectively. Left lung perfusion was significantly decreased just after diaphragmatic palsy but it was not changed thereafter. The decrement of lung perfusion was not affected by the body weight. The decreased amount of left lung perfusion was reciprocally correlated with the body weight of the rabbits on the postoperative 3rd day but not 10th day. **Conclusion :** Left lung perfusion percent of the rabbits was decreased 7% with the induction of diaphragmatic palsy and the decreased amount was reciprocally correlated with the body weight just after the diaphragmatic palsy was induced. (Korean Circulation J 1999;29(4):408-414)

KEY WORDS : Diaphragmatic palsy · Lung perfusion scan.

서 론

가

Fallot

가

: 1998 11 9

: 1999 4 2

: , 110 - 744

28

: (02) 760 - 3570 · : (02) : 743 - 3455

가 가
 가 가 .

가 . ketamine(25 mg/kg)

재료 및 방법

20

fluoroscopia

3 10

copy

cine - film

10 가
3

fluoroscopy
 cine - film
 fluoroscopy

(supine position)

fluoroscopy

2 cine - film

가

3

가

10

가

3

3

10

가 3 47.5%
10 31.6%
Wilcoxon 몸무게와 좌측 폐관류량의 비교
signed rank test 3 10

regression analysis

20 4 가

3

가

2

가

12

Fig. 3

Table 1. Change of left lung perfusion before and after left diaphragmatic palsy

	Lt lung perfusion	(95% CL)
Pre-op	45.93 ± 6.42%	(33 59%)
Post-op day 3	32.48 ± 6.09%	(20 45%)
Post-op day 10	37.62 ± 3.39%	(31 44%)

Abbreviation) Lt ; left, op ; operation, CL ; confidence limit

결 과

횡격막 마비 전과 후의 좌측 폐관류량의 변화

가

Table 1

45.93 ± 6.42%

3

32.48 ± 6.09%

10

37.62 ± 3.39%

(p<0.05).

가

3

10

10

가

(Fig. 1).

Fig. 2

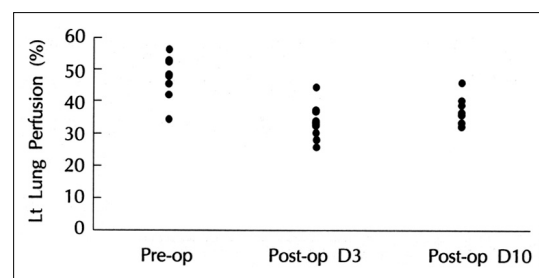


Fig. 1. Change of left lung perfusion before and after left diaphragmatic palsy. Left lung perfusion percent was 45.93 ± 6.42% before operation and significantly decreased to 32.48 ± 6.09% and 37.62 ± 3.39% on 3rd and 10th postoperative day, respectively.

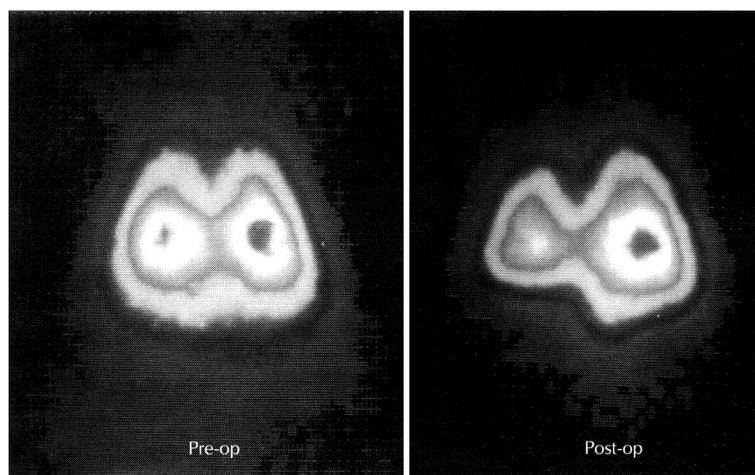


Fig. 2. Results of lung perfusion scan before diaphragmatic palsy (Pre-op) and on 3rd postoperative day (Post-op) in one rabbit. Left lung perfusion percent was decreased from 47.5% to 31.6%. Pictures of lung perfusion was taken in prone position.

몸무게와 좌측 폐관류량의 변화량과의 비교

3

가 ($r = -0.7177$,

$p < 0.05$, Fig. 4).

3

가

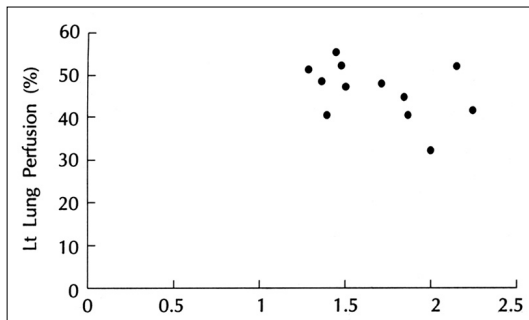


Fig. 3. Left lung perfusion according to the weight of rabbits before inducing left diaphragmatic palsy. There was no relationship between left lung perfusion percent and the weight of the rabbits.

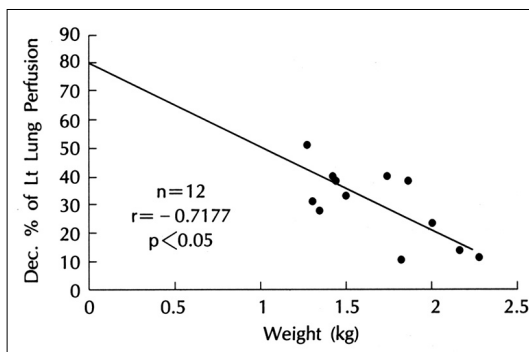


Fig. 4. Decreased percent of left lung perfusion on 3rd postoperative day. The extent of decrease in left lung perfusion was reciprocally correlated with the body weight of the rabbits.

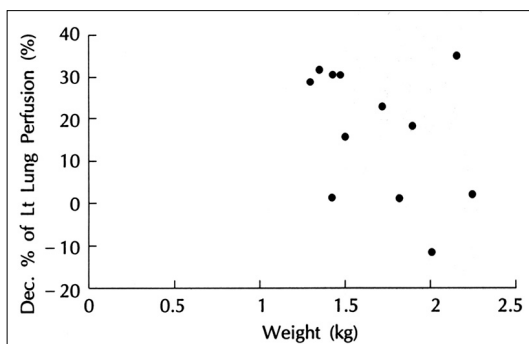


Fig. 5. Decreased percent of left lung perfusion on 10th postoperative day. The extent of decrease in left lung perfusion was not correlated with the body weight of the rabbits.

10

가

(Fig. 5).

고 찰

1.2 3%

가

1-5)

Mok 6)

10%

Mok 6)

가

Mok 6)

(open heart surgery)

가

Mustard ,

, Fallot

가

Glenn anastomosis, Blalock - Hanlon
atrial septectomy, Blalock - Taussig shunt

3)

가

bypass

topical slush

7)8) bypass

가

6)

atelectasis가

(media -

stium)

가

가

9)

atelectasis가

가

¹⁰⁾¹¹⁾ 7% 가
 가
 가
 aggregate 가
 가 3
¹²⁾ 15O - water 가
 PET(positron emission tomography) 가
¹³⁾ 가 가
 가 가
 가
 Friedman ¹⁴⁾ 가
 가 ^{15 - 17)} 가
 가
 가
 가 가 가
 가 가 가
 20 30% 가
¹⁸⁾¹⁹⁾ 가
 가 4가 가
 가
 가
 가 가
 fluoroscopy 가
 46%
 45%
²⁰⁾ 가
 3 32% 10
 38%
 가

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