

## **Abstract**

### **The Therapeutic Effects of an Early Exercise Program After Mastectomy**

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The purposes of this study were to investigate the therapeutic effects of an early exercise program after mastectomy and to provide the early exercise program protocol for patients who had undergone mastectomy. The subjects were seventy women who were diagnosed with breast cancer. They were randomly assigned either to a experimental group (n=35) that received early postoperative exercise program or to a control group (n=35) that received only education by nurses. Data were obtained for each patient from goniometric measurements of shoulder flexion, abduction, external rotation, 10 elements of functional performance, and subjective pain evaluation using visual analogue scale (VAS). All variables were measured preoperatively, three days postoperatively, and one month postoperatively. Data were compared by groups using independent t-test and Mann-Whitney *U* test for parametric or non-parametric data, respectively.

There were no significant differences between the groups for all variables preoperatively and at three days postoperatively. But there were significant differences at one month postoperatively. The experimental group showed a statisti-

cally significant increases in shoulder flexion, abduction, and external rotation and in the pain VAS at one month postoperatively ( $p < .05$ ). Also, at one month postoperatively, the experimental group had less difficulty with three elements of functional performance - doing up a 'back' zippered article of clothing, reaching the ipsilateral scapula, and contralateral scapula with the fingers on the operated side - than the control group ( $p < .05$ ).

The results of this study suggest that, after mastectomy, the early exercise program conducted by a well-trained physical therapist can make a significant contribution to the return of more normal shoulder function and activities of daily living and to an increased quality of life.

**Key Words :** Mastectomy; Early exercise program protocol.

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10 , 1999).  
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, 50 가 ,  
( , 1995; Harris ,  
1991).  
(chest fascia),  
( , 1995; , 1997). . 1970  
40 가  
( (modified radical mastectomy)  
, 1998; , 1986;  
1992; , 1996; , 1998;  
, 1999). 가 ,  
가 가  
가 (Fisher , 1985a; Fisher  
, 1985b; Maddox , 1987; Osborne  
Borgen, 1990).  
(breast conservation treatment)  
가, 가 가  
가,  
가 가 ( , 1996;  
, 1995; Sarrazin , 1989; Van  
Dongen ; 1992). 가  
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( , 1998; , 1998; , 1999). (anger), 가 (Adcock, 1990; Ganz, 1990; Nail King, 1987). (incisional area), (shoulder girdle), (phantom breast pain) ( , 1999; Adcock, 1990; Kisner Colby, 1996). (swelling), 가 (abduction), (flexion), 90° 가 (Ganz, 1990; Gutman , 1990; Hladiuk , 1992; Ward , 1989). (seroma) 가 가 (Adcock, 1990; Bertelli , 1991; Ganz, 1990). 가 (Dawson , 1989; Flew, 1979; Lotze , 1981; Schultz , 1997). (fibrosis), (chest wall) 가 가 (Gutman , 1990; Jansen , 1990; Na , 1999; Petrek , 1990; Pollard , 1976; Wingate, 1985; Wingate , 1989). (adhesion) 가 (upper back) (Gutman , 1990; Hladiuk , 1992; Kisner Colby, 1996; Wingate , 1989). (tightness), 가 (rounded) (kyphosis) (Visual Analogue Scale: VAS) (alignment) (lateral) (postural fault) (Adcock, 1990; Beeby Broeg, 1970).

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(biopsy)

가 가 가 가  
 70  
 1999 8 2000 3

35

35

90°

(neutral position)

2. 가 가

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 가 가

(Palmar Epler, 1998).

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가 가  
 가  
 (conventional gonio-  
 meter)  
 (Riddle , 1987).

0( )  
 4( )  
 (Na , 1999; Wingate, 1985; Wingate  
 , 1989).

meter)

(stationary arm)  
 (midaxillary line)  
 (moving arm)

( 가 )  
 가 ( )

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 (proprioceptive neuromuscular facilitation  
 patterns), (functional  
 activities)  
 (hemobag)  
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 (VAS)  
 Cole (1994) 가  
 100 mm 4.  
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 가  
 t-  
 (Mann-Whitney) *U*  
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 3.  
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 30 40 2 ( 1). (46.0 ± 7.9)  
 (47.5 ± 10.1) 가  
 (1999), Beeby Broeg(1970),  
 Kisner Colby(1996), Na (1999), Petrek (11.9  
 (1990), Wingate(1985), Wingate ± 2.8) (11.8 ± 3.8)  
 (1989) 가  
 2.  
 (chest expansion , (stage),  
 exercise) 2 ( )  
 2).  
 (general conditioning exercise), 24 , 11

1. (n=70)

( )	46.0 ± 7.9*	47.5 ± 10.1
(kg)	58.4 ± 6.5	57.0 ± 6.7
(cm)	159.1 ± 4.7	158.7 ± 4.1
( )	11.9 ± 2.8	11.8 ± 3.8

\* ±

2. (n=70)

		24	27
		11	8
(stage)	1	4	5
	2	31	30
		16	17
		19	18

3. ( : )

			t	p
	178.29 ± 3.82*	178.43 ± 3.16	.170	.865
3	97.43 ± 15.40	95.29 ± 11.69	.657	.514
1	159.71 ± 13.28	52.86 ± 11.65	2.296	.025**

\* ± , \*\*p<.05

27 , 8 (stage) 3 가 .  
 1 가 4 , 2 가 31 1  
 1 가 5 , 2 가 30 (159.71 ± 13.28) (152.86 ± 11.65)  
 가 가 (p<.05),  
 16 , 19 ( 3).  
 17 , 18 .  
 3. 가 3 가 .  
 가. 1 (148.69  
 ± 18.74) (137.86 ± 16.25)

4. ( : )

			t	p
	178.00 ± 4.73*	177.86 ± 4.07	.135	.893
3	86.86 ± 11.76	84.00 ± 11.10	1.045	.300
1	148.69 ± 18.74	137.86 ± 16.25	2.576	.012**

\* ± , \*\*p<.05

5. ( : )

			t	p
	88.86 ± 2.73*	89.00 ± 2.66	.222	.825
3	51.26 ± 4.00	51.43 ± 12.16	.046	.964
1	75.77 ± 12.34	69.06 ± 12.16	2.293	.025**

\* ± , \*\*p<.05

6. 3 1 ( : cm)

			t	p
3	5.66 ± 2.25*	5.80 ± 1.55	.310	.758
1	2.57 ± 2.21	3.46 ± 1.36	2.083	.041**

\* ± , \*\*p<.05

가 가 (p<.05),( 4). 가 . (2.57 ± 2.21)  
1 (3.49 ± 1.36)  
가 (p<.05).  
3 가 .  
1 5. (75.77 ± 12.34) (69.06 ± 12.16) 3 10가  
가 가 (p<.05), 가 .  
( 5). 1 ,  
4. ,  
3 1 ( 6). (p<.05),( 7).  
3

7. 1

			<i>U</i>	<i>Z</i>	<i>p</i>
34.50	1207.50	577.50	- 1.425	.154	
36.50	1277.50				
31.64	1107.50	477.50	- 1.820	.069	
39.36	1377.50				
35.50	1242.50	612.50	.000	1.000	
35.50	1242.50				
34.73	1215.50	585.50	- .350	.727	
36.27	1269.50				
30.16	1055.50	425.50	- 2.276	.023*	
40.84	1429.50				
29.70	1039.50	409.50	- 2.771	.006**	
41.30	1445.50				
30.89	1081.00	451.00	- 2.803	.005**	
40.11	1404.00				
34.47	1206.50	576.50	- 1.051	.293	
36.53	1278.50				
33.07	1157.50	527.50	- 1.111	.267	
37.93	1327.50				
33.36	1167.50	537.50	- .928	.353	
37.64	1317.50				

\*p<.05, \*\*p<.01

가  
 Dawson (1989)  
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 5  
 5  
 가  
 Lotze (axillary dissection)  
 (1981)  
 36  
 1 7  
 가  
 Schultz (1997)  
 163  
 1 7  
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 가  
 Petrek (1990) , 3 ,  
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 57 1 5 3  
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 2.57 ± 2.21  
 가 가 3.46 ± 1.36 (p < .05).  
 , (emotional support) 가  
 . Jansen (1990) 가  
 144 1 .  
 8 가 가 가  
 가 가 가  
 . Na 가  
 (1999), Wingate(1985), Wingate Gutman (1990), Wingate  
 (1989) Wingate (1989) 가 가  
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 가 40 ,  
 가 가 50 50 60  
 가 가 가  
 가 가 3  
 가 , ,  
 가 가 1  
 159.71 ± 13.28° 152.86 ±  
 11.65° 가 (p < .05).  
 가 148.69 ± 18.74°  
 75.77 ± 12.34° 137.86 ± 16.25°  
 69.06 ± 12.16° 가 (p < .05).  
 . Lotze (1981)  
 가

Gutman (1990), Na (1999), Wingate (1985), Wingate (1989)

가 (p<.05).

10가  
 가 . Wingate(1985) 5  
 가

(p<.05). 3 가 1

.05). Wingate (1989) 가 5 (p< 가 6  
 가

(p<.05). 3 가 가가

가 (p<.05). Na (1999) 가  
 3 1

가 (p<.05). 3

3 가

가 1  
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- . 1998;55( ) :959-972.
- , 1995:571-618.
- . 1995.
- . 1996;50:202-210.
- . 1986;30:416-426.
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Rehabilitation of the mastectomy  
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1.

1 3	<ul style="list-style-type: none"> <li>• ( , , )</li> <li>•</li> <li>•</li> <li>•</li> <li>• 가</li> <li>• 45°</li> <li>• 가</li> </ul>
4 6	<ul style="list-style-type: none"> <li>• ( , , )</li> <li>•</li> <li>•</li> <li>•</li> <li>• - 가</li> <li>• 90°</li> <li>• 45°</li> <li>• 가</li> </ul>
7 14	<ul style="list-style-type: none"> <li>• ( , , )</li> <li>•</li> <li>•</li> <li>•</li> <li>• 가</li> <li>• 가</li> <li>•</li> <li>•</li> <li>•</li> </ul>
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