

## Outcome and Prognostic Factors Associated with Poor Outcome of Biofeedback Therapy for Constipated Patients with Non-relaxing Puborectalis Syndrome

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**Purpose:** Biofeedback is a major treatment method for constipated patients with non-relaxing puborectalis syndrome. However a significant percent of patients still showed poor outcome, and little has been known about the predictors associated with outcome of biofeedback. The aim of this study was to determine the outcome and identify predictors associated with poor outcome of biofeedback therapy for constipated patients with non-relaxing puborectalis syndrome.

**Methods:** Fifty-two constipated patients with non-relaxing puborectalis syndrome (median age, 47 years) who had more than one biofeedback session after defecography were evaluated by standardized questionnaire, before, immediately after treatment, and at follow-up. Clinical bowel symptoms and anorectal physiological studies were analyzed. Any differences in demographics, clinical symptoms, and parameters of anorectal physiological study were evaluated between success group (patients felt improvement in symptoms at follow-up) and failure group (patients felt no improvement).

**Results:** Follow up (mean follow-up; 17 months) results were evaluated by an independent observer in 45 patients. At post-biofeedback, 42 (81 percents) patients felt improvement in symptoms, including 7 (13 percents) with complete symptom relief. At follow-up, 25 (56 percents)

patients felt improvement in symptoms, including 1 (2 percents) with complete symptom relief. There was a significant reduction in difficult defecation (from 81 to 44, 53 percent, from pre-biofeedback to post-biofeedback, and at follow up respectively;  $P<0.005$ ,  $P<0.01$ ), sensation of incomplete defecation (from 90 to 50, 40 percent;  $P<0.00001$ ,  $P<0.000005$ ), laxative use (from 25 to 10, 11 percent;  $P<0.05$ ), and enema use (from 13 to 0, 2 percent;  $P<0.01$ ,  $P<0.05$ ). Normal spontaneous bowel movement was increased from 42 percent pre-biofeedback to 81 percent post-biofeedback ( $P<0.0001$ ), 80 percent at follow up ( $P<0.0005$ ). Pre-biofeedback presence of symptoms of bowel habit change predict poor outcome (15 vs. 0 percent; failure vs. success,  $P<0.05$ ). High pressure zone in prebiofeedback manometry was longer in failure group than in success group (2.80 vs 2.01 cm,  $P<0.05$ ). In the success group, 11 (44 percent) had a rectocele, 1 (4 percent) had a rectal intussusception, 18 (72 percent) had a descending perineal syndrome, and 3 (12 percent) had a sigmoidocele. In the failure group, 4 (20 percent) had a rectocele, and 1 (5 percent) had a rectal intussusception, 14 (70 percent) had a descending perineal syndrome, and a sigmoidocele was not accompanied ( $P>0.05$ ). Accompanied rectocele, rectal intussusception, descending perineal syndrome, and sigmoidocele did not influence outcome.

**Conclusions:** Biofeedback is an effective option and should be considered as the first line therapy. Bowel habit change and long high pressure zone in pre-biofeedback manometry were predictors associated with poor outcome of biofeedback therapy for constipated patients with non-relaxing puborectalis syndrome. *J Korean Soc Coloproctol* 2003;19:74-81

**Key Words:** Non-relaxing puborectalis syndrome, Biofeedback, Bowel habit change, High pressure zone

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1 가 , , 2

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3 가

non-relaxing puborectalis syndrome,<sup>4</sup> anismus,<sup>5</sup> spastic pelvic floor syndrome,<sup>6</sup> paradoxical puborectalis syndrome,<sup>7</sup> rectal dyschezia<sup>8</sup>

80% 20

1 (sacral promontory) (pubococcygeal line)

5,9,10 11

가

, 2 (pubococcygeal line) (ischiococcygeal line)

, 3 (ischio-coccygeal line)

가

(rest) 5cm (push)

6,12-16

가

가 5cm

(anal plug EMG)

17

2

1 cm (rest) (squeeze) (push)

1999 8 2002 7

50% 20 mmHg

60

가 2 8

) 52 ( 17 , 35 12 mm, 45 mm (Perry Meter anal EMG sensor EPS-21)

47.7±19.3

가

가

(Sitzmarks™) 24 가 3

3 5

가 20% 5 가

20% 가

20% 5 25 20

5 17 (3~36 ) 가

12 mm, 45 mm  
PerryMeter anal EMG sensor EPS-21 (PerryMeter Systems, Strafford, Pennsylvania, U. S. A.)  
Kontinence (HMT. Co, Seoul, Korea)

(EMG-based biofeedback)

3 ( 8 )

가 1 30~ ) 1

anal plug EMG

Descriptive statistics, t-test chi-square test  
the Analysis tool pak  
(Microsoft Excel 97, 4.00.950, Microsoft Cooperation)

P value가 0.05

( )

188 60 (32%)

가

35 : 7  
 2  
 4 (0.5~60 )

**Table 1.** Bowel symptom and bowel movement (pre- and post-biofeedback and at follow up)

	Pre- biofeedback (n=52)(%)	Post- biofeedback (n=52)(%)	P value	Pre- biofeedback (n=45)(%)	At follow up (n=45)(%)	P value
Difficult defecation	42 (81)	23 (44)	< .0005	36 (80)	24 (53)	< .01
Incomplete defecation	47 (90)	26 (50)	< .00001	40 (89)	18 (40)	< .000005
Laxative use	13 (25)	5 (10)	< .05	10 (22)	5 (11)	NS*
Enema use	7 (13)	0 (0)	< .01	6 (13)	1 (2)	< .05
Normal frequency of bowel movement	28 (54)	44 (85)	< .001	24 (53)	38 (84)	< .005
Normal frequency of spontaneous bowel movement	22 (42)	42 (81)	< .0001	19 (42)	36 (80)	< .0005

\* NS=not significant.

**Table 2.** Predictors of clinical characteristics for biofeedback success at follow up

Predictors	Success (n=25)	Failure (n=20)	P value
Age (years)	51.8±17.7*	43.4±21.2	NS <sup>†</sup>
Gender, M :	7 : 18	9 : 11	NS
Duration of symptoms (years)	8.3±12.5	6.4±9.8	NS
Bowel movement (frequency/week)	5.5±4.1	3.9±4.1	NS
Bowel symptom (%)			
Difficult defecation	82	90	NS
Incomplete defecation	92	85	NS
Laxative use	24	20	NS
Enema use	16	10	NS
Hard stool	44	30	NS
Small caliber stool	44	45	NS
Bloating	28	10	NS
Bowel habit change	0	15	0.04
Disease & medication history (%)			
Diabetes Mellitus	4	0	NS
Hypertension	8	5	NS
Back pain	8	15	NS
Psychotherapeutic drug	4	10	NS
Analgeics	8	0	NS
Antacid	4	0	NS
Others			
Mean number of session of biofeedback	5	4	NS
Finish of treatment by patient (%)	36	40	NS
Mean period of follow up (month)	17.6±10.5	16.3±9.1	NS

\*Mean±standard deviation; <sup>†</sup>NS = not significant.

**Table 3.** Predictors of anorectal physiologic study for biofeedback success at follow-up

Predictors	Success (n=25)	Failure (n=20)	P value
<b>Manometry</b>			
Mean resting pressure (mmHg)	55.0±27.1*	71.0±25.5	NS <sup>†</sup>
Maximum resting pressure (mmHg)	59.3±27.8	61.1±49.7	NS
Mean squeeze pressure (mmHg)	73.1±43.4	93.4±68.2	NS
Maximum squeeze pressure (mmHg)	91.2±53.8	118.0±82.6	NS
Mean push pressure (mmHg)	61.5±38.0	75.8±29.4	NS
Maximum push pressure (mmHg)	72.7±44.7	87.8±32.3	NS
High pressure zone (cm)	2.0±1.1	2.8±0.7	0.01
Sensory threshold (ml)	24.6±10.5	28.4±18.5	NS
Rectal capacity (ml)	212.7±81.0	162.8±53.5	NS
Rectal compliance (ml H <sub>2</sub> O/mmHg)	14.5±8.7	9.6±8.3	NS
<b>Defecography</b>			
Anorectal angle, rest (degree)	99.5±19.1	104.2±21.0	NS
Anorectal angle, squeeze (degree)	76.6±15.4	83.7±18.9	NS
Anorectal angle, push (degree)	100.9±16.9	100.1±19.8	NS
Perineal descent, rest (cm)	6.3±2.2	5.8±2.2	NS
Perineal descent, squeeze (cm)	4.0±1.7	3.8±1.7	NS
Perineal descent, push (cm)	6.9±2.2	6.0±1.8	NS
Puborectalis length, rest (cm)	13.9±1.9	13.1±2.0	NS
Puborectalis length, squeeze (cm)	11.3±1.3	11.1±1.4	NS
Puborectalis length, push (cm)	13.8±2.0	13.0±1.9	NS
Rectocele (%)	44	20	NS
Rectal intussusception (%)	4	5	NS
Sigmoidocele (%)	12	0	NS
Fixed perineal descent (> cm at rest)(%)	72	70	NS
<b>Electromyography (μV)</b>			
Rest	3.7±3.9	6.5±6.3	NS
Squeeze	8.3±6.9	11.7±10.3	NS
Push	4.9±4.0	9.1±10.8	NS

\*Mean±standard deviation; <sup>†</sup> NS=not significant.

2 , 4 (2~11 )  
 2 , 1 가 31 (60%), 가  
 3 , 가 3 , 가 1 , 21 (40%)  
 가 1 , 4 , 가 5 52  
 2 , 45 (87%)  
 가 2 (P=0.0002),  
 가 19 (37%), 1 (P=0.000007), (P=0.007)  
 가 4 (8%), 3 (6%), (P=0.04)  
 15 (71%) 27 (P=0.008),  
 (52%) 6 (22%), (P=0.000002), (P=0.049)  
 1 (4%) (anal plug EMG)  
 46 39 (85%) 81%(P=0.00006) 가  
 34 80%(P=0.0002)  
 27 (79%) (Table 1). 42

4 :

(81%) 가 30  
 42 7 (13%)  
 25 (56%)  
 가 가  
 (P=0.04).  
 가  
 (P=0.02). , ,  
 가 (Table 2).  
 가 11 (44%),  
 1 (4%), 18 (72%),  
 가 3 (12%)가  
 가 4 (20%), 1 (5%),  
 14 (70%)가  
 , ,  
 가  
 (Table 3).

84%  
 Gilliland<sup>3</sup>  
 194  
 29%  
 63%  
 (EMG baedbiofeedback) 1 1 1 4  
 81%, 17  
 56% , ,  
 가  
 Batolo<sup>21</sup> 53%, Wexner<sup>22</sup> 33%  
 32%  
 Mathers<sup>23</sup>  
 , , ,  
 24  
 25

31% 100%  
 6,12-16  
 Weber<sup>13</sup>  
 (Manometry based system)  
 Bleijenberg Kuijpers<sup>6</sup> (Elec-  
 tromyography based system)

6  
 Bleijenberg Kuijpers<sup>6</sup>가  
 가  
 Gilliland<sup>3</sup>  
 가  
 Lubowski<sup>26</sup>  
 가  
 (anal canal hyper-  
 tonia)  
 Park<sup>27</sup>  
 Rhee<sup>17</sup> 가  
 (rectal maximum tolerable volume)  
 가  
 Chi

Glia<sup>18</sup>  
 10  
 80% ,  
 100%  
 Wexner<sup>12</sup> 18  
 9 , 9  
 18 16 (89%)  
 가 Patankar<sup>19</sup>

Gilliland<sup>3</sup>  
 가  
 Lubowski<sup>26</sup>  
 가  
 (anal canal hyper-  
 tonia)  
 Park<sup>27</sup>  
 Rhee<sup>17</sup> 가  
 (rectal maximum tolerable volume)  
 가  
 Chi

, , ,  
 가  
 , ,  
 가  
 (high pressure zone)

가

가 가  
가

가  
가

가

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2 1

가 가

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가

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