

Research Article

The relationship of lip strength and lip sealing in MFT

Masaru Satomi (*Satomi Orthodontic Clinic*)

Suggested Citation

Satomi, M. (2001). The relationship of lip strength and lip sealing in MFT. *International Journal of Orofacial Myology*, 27(1), 18-23.

DOI: <https://doi.org/10.52010/ijom.2001.27.1.2>



This work is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](#).

The views expressed in this article are those of the authors and do not necessarily reflect the policies or positions of the International Association of Orofacial Myology (IAOM). Identification of specific products, programs, or equipment does not constitute or imply endorsement by the authors or the IAOM. The journal in which this article appears is hosted on [Digital Commons](#), an Elsevier platform.

The Relationship of Lip Strength and Lip Sealing in MFT.

Masaru Satomi D.D.S., Ph.D.

ABSTRACT

The purpose of this study was to explore the relationship between lip sealing and lip power, and the effect of button pull exercise on lip posture and lip power. 91 patients who had barely acquired lip sealing had received button pull exercise. They were evaluated for lip power and lip seal before and after Oral Myofunctional treatment. In spite of contrary postures of lip between the Button Pull Group and the Non-Button Pull Group no significant difference for lip strength was found at the first examination. The lip strength of the Button Pull Group had increased twice as much after a half-year and decreased thereafter. 25% of the Button Pull Group acquired complete lip sealing after the treatment, 41% did incompletely and 31% did not change.

KEY WORDS: lip sealing posture, lip strength, button pull exercise

INTRODUCTION

In orthodontic treatment, the importance of functional improvement along with structural treatment has been addressed. One of the objectives of functional treatment is the acquisition of lip seal. Adequate lip power has been considered important for acquisition of lip sealing in oral myofunctional therapy (MFT).

Although lip power of 1.4-2.0kg has been widely supported as a target value, evidence of the effect of lip power on lip seal has not been clearly shown. In this study, changes in lip power were observed for patients who received button pull lessons. Changes in lip seal as a result of changes in lip power were assessed.

MATERIALS:

The control group consisted of 100 new patients who had acquired lip sealing. This group was used to compare characteristics within the population selected for this study when compared to a typical population seeking orthodontic treatment. Characteristics considered were age, sex and classification by case group. The mean age of the control group was 11.2 years. The treatment group consisted of 91 patients who received button pull lessons.

This Button Pull Group had a mean age of 11.2 (Table 1, fig.1). Both groups had almost the same standard deviations of age. The age characteristic of the patients who received MFT at our clinic is that most of patients were children from 5 to 15 years old. The male to female ratio was 1:3. This ratio nearly corresponds to the ratio of patients who received orthodontic treatment in our clinic.

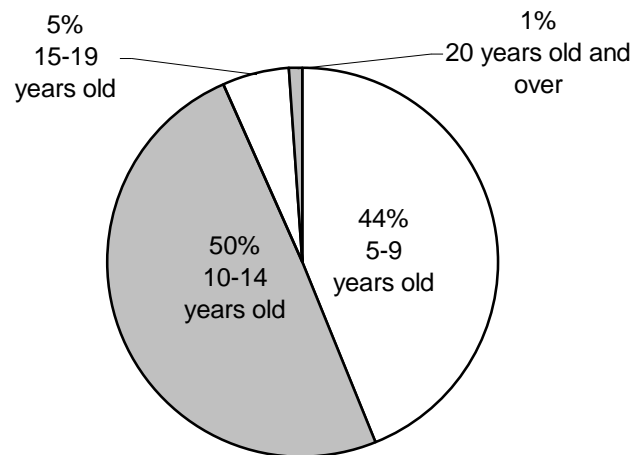
Of the patients in the Button Pull Group, the most frequent classification by case group, was reversed occlusion (tongue in lower position) Open bite cases (protrusion of tongue) represent the second largest number of patients (Table 2, fig.2). This represents a typical orthodontic population.

METHODS:

Lip power was measured using a tension gauge. A comparative study (OBA KEIKE. SS, fig.3,4) was conducted. Change in lip power of the patients who received button pull lessons (Button Pull Group) was measured over time. The relationship

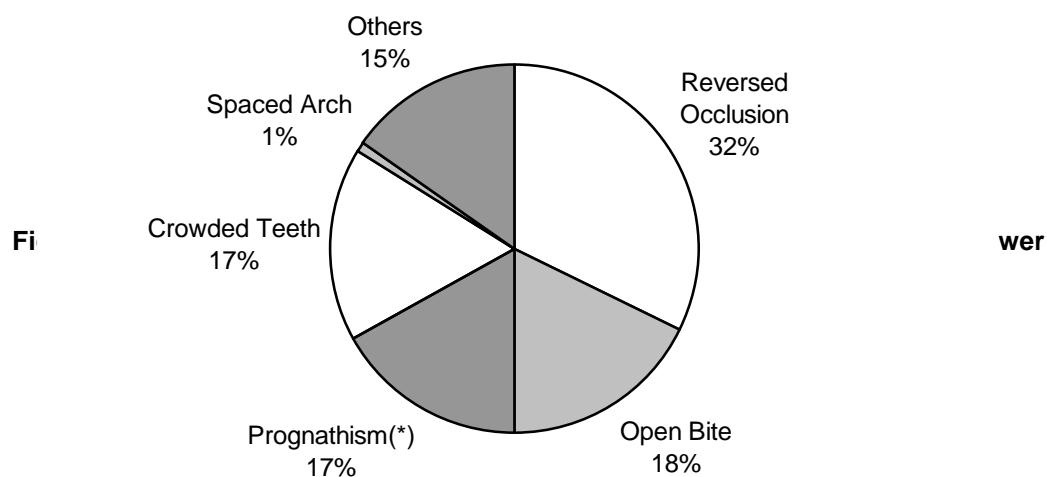
Table 1: age of 91 patients in the button pull group when MFT was started

	Male	Female	Total
5-9 years old	13	27	40
10-14 years old	9	36	45
15-19 years old	2	3	5
20 years old and over	0	1	1
Total	24	67	91

Fig. 1: age of 91 patients in the button pull group when MFT was started**Table 2: the numbers of patients in the button pull group classified by case group**

	Male	Female	Total
Reversed Occlusion	7	29	36
Open Bite	3	17	20
Prognathism(*)	6	13	19
Crowded Teeth	4	15	19
Spaced Arch	1	0	1
Others	6	11	17
Total number of persons (**)	27	85	110

(*) including deep over bite (**) overlapping

Fig. 2: the numbers of patients in the button pull group classified by case group

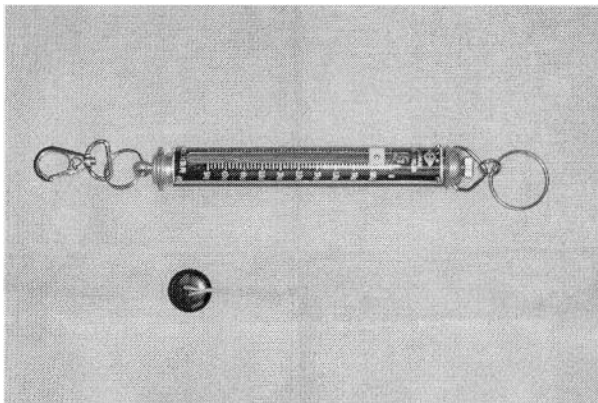


Fig. 5: button pull exercise

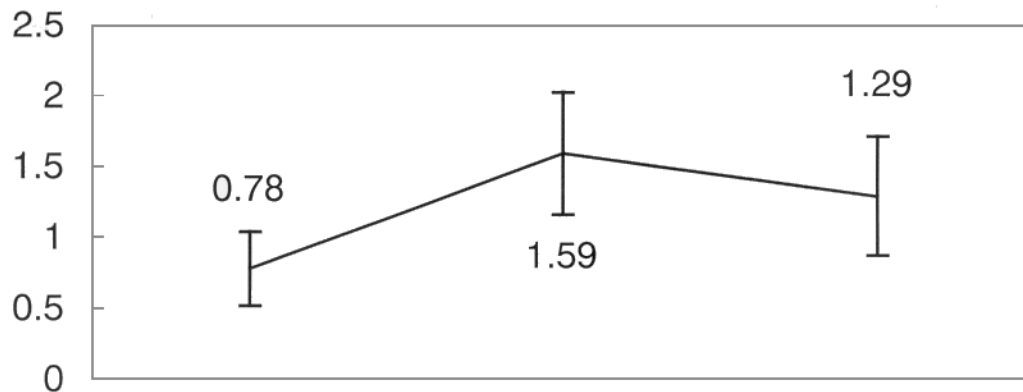


Table 3: Change of lip power of the button pull group

	Mean	SD	
1) Control group (n=100)	0.81	0.33	
2) Button pull group (n=91)			
a) At the time of initial medical examination	0.78	0.26	
b) Max. value (**)	1.59	0.43	*
c) 9 months after start of treatment	1.29	0.42	*
d) Patients who became able to seal lips (n=26)	1.23	0.20	*

(**)approx. 6.5 months after start of treatment

* significant at 1% level

Fig. 6: Change of lip power of the button pull group

between change in lip power and acquisition of lip sealing was studied.

A comparison was also made between the 91 patients in the Button Pull Group (BPG) and a group of 35 patients who received MFT but did not receive the button pull exercise, the Non Button Pull Group (N-BPG). The total treatment population included 126 patients.

LESSON PROCEDURE

A 7/8-inch button with a kite string was used for the button pull lesson (fig.5).

1. Ask the patient to occlude his or her molars. Place a button between the front teeth and the lip. The patient closes the lips.
2. The patient tightens lip sealing and pulls the string forward while counting three seconds.
3. Allow patient to rest.
4. The patient performs this lesson at least once a day.

RESULTS:

The average lip strength of the Button Pull Group as measured by a tension gauge at the beginning of the MFT was 0.78Kg with a standard deviation of 0.26. In comparison, the N-BPG group had slightly stronger lip strength than the Button Pull Group, however there was no significant difference

between groups.

The average value for lip strength increased for the Button Pull Group during the training period and reached the maximum value (1.59kg) approximately 6.5 months after beginning treatment. However, lip strength decreased thereafter even though the training continued (Fig 6 & Table 3).

At the beginning of the training 3(3%) patients of the Button Pull Group already maintained a closed lip posture. The initial value of their lip strength was higher than the lip strength of others in the Button Pull Group. 23 patients developed the ability to seal their lips after total treatment, which included orthodontic procedure. However, 37 patients did not achieve an habitual closed lip posture, and for 28 patients the incorrect lip posture remained (table 4).

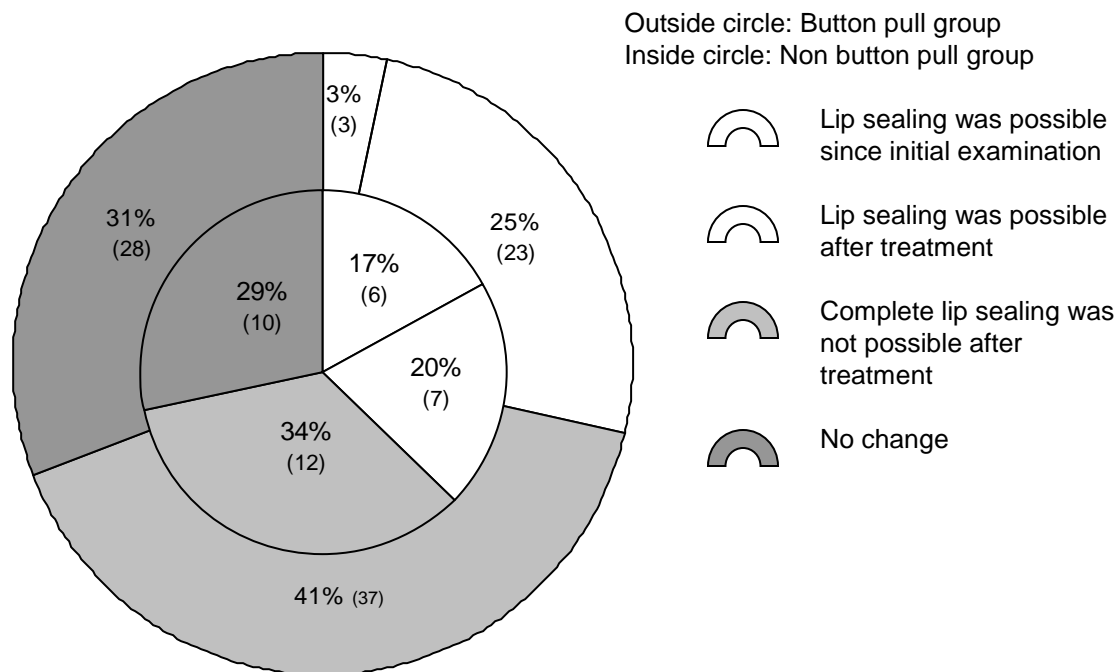
The mean value of lip power for patients who developed the ability to seal their lips after button pull lessons was 1.23kg. There was no significant difference in the average value of lip power for group members at the 9 months after the initiation of treatment (table 3).

The Non Button Pull Group, received MFT but not the button pull lessons. 6

Table 4: At the time of initial medical examination, lip power value of patients who received MFT at the same time

	Button pull group		Non button pull group	
	number	kg	number	kg
Lip sealing was possible since initial examination	3	1.00±0.20	6	1.10±0.25
Lip sealing was possible after treatment	23	0.72±0.18	7	0.88±0.15
Complete lip sealing was not possible after treatment	37	0.79±0.26	12	0.68±0.41
No change	28	0.70±0.24	10	0.74±0.30
Total	91	0.78±0.26	35	0.86±0.29

Fig 7: At the time of initial medical examination, lip power value of patients who received MFT at the same time



(17%) of 35 patients demonstrated correct lip posture at the time of the initial evaluation. They also showed a higher level of lip power at this time. 7 patients developed the ability to seal their lips, 12 demonstrated the ability to seal their lips but it was not habitual, and in 10 patients incorrect lip posture remained (Table 4 & Fig 7).

DISCUSSION:

Of the total treatment population of 126 patients who received MFT including 91 patients in the BPG and 35 patients in the N-BPG, only 9 had demonstrated appropriate lip seal/rest posture at the time of the initial evaluation. Initially these 9 patients demonstrated lip power

that was stronger than that of other patients in the treatment population as a whole. However, there was no significant difference in lip power between the patients in the BPG and the N-BPG who demonstrated proper rest posture at the time of the initial evaluation.

For the 30 patients who developed the ability to demonstrate appropriate lip rest posture after MFT, there was an increase in lip sealing power. However, there was not a significant difference between the BPG and the N-BPG. Patients who received MFT developed a similar level of lip seal strength. This means that lip strength may be increased through MFT without the use of the button pull exercise and practice.

Even though there was a significant increase in lip power within the BPG, only 26 patients demonstrated appropriate lip seal/rest posture after MFT. This included the 3 patients who demonstrated appropriate lip posture at the time of the initial evaluation.

72% of the 91 patients in the BPG were unable to demonstrate habitual lip seal/ rest posture after MFT even though there was a demonstrated increase in lip strength (Fig.7).

The N-BPG also demonstrated an increase in lip strength. There were 13 patients who demonstrated appropriate lip seal/rest posture after MFT. This included 6 patients who demonstrated appropriate lip posture at the time of the initial evaluation.

63% of the 35 patients in the N-BPG were unable to demonstrate habitual lip seal/ rest posture after MFT which did not include the button pull exercise, even though there was a demonstrated increase in lip strength (Fig. 7).

Therefore, a lesser percentage of the population who did not receive the button pull practice, were unsuccessful in demonstrating appropriate lip seal at the end of treatment than the group who did receive the button pull practice. The reason for this is unclear.

However, additional research should be conducted to identify other factors that may impact on the acquisition of lip seal. It would be interesting to replicate the current study in an attempt to identify intervening variables that may effect the outcome of MFT. Variables that may be considered include allergies, enlarged tonsils and/or adenoids, body posture, and facial type – mesocephalic, brachiocephalic, dolicocephalic.

Lip power increased due to the button pull lessons. Change in lip power with the passage of time for patients who received button pull lessons reached maximum value (mean value: 1.59kg) in a few months. However, lip power (mean value: 1.29kg) decrease thereafter. This strange phenomenon during MFT should be considered as “burning out”. It may be a result of regression toward the mean.

CONCLUSION:

Based on the results of this study, the following suggestions are recommended:

1. The button pull exercise is not the differentiating factor in the development of lip strength or of lip seal for the typical orthodontic population.
2. Reinforcement of lip sealing power does not necessarily lead to the acquisition of lip sealing/proper lip rest posture.
3. Target value of lip power training can be reduced from the current target value (1.5 - 2.0 kg).

Contact the Author:

SATOMI ORTHODONTIC CLINIC

Kinomicho 9-52, Yamagata-city,

Yamagata, JAPAN 990-0044

TEL: 81-23-632-9553 FAX: 81-23-632-9554

E-mail: satomi@mail.dewa.or.jp