

A Comparison of the Dynasplint Trismus System to Tongue Depressor Therapy in Improving Treatment-Related Trismus



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Abstract

Objective: To investigate the effectiveness of the Dynasplint Trismus System (DTS) compared to tongue depressor therapy for treating trismus.

Design: Single-institution prospective randomized study

Setting: Academic tertiary care medical center.

Patients: A total of 53 patients with trismus as a complication of cancer treatment were enrolled in the study between 2007 and 2013. 27 patients were randomized to a treatment arm using the DTS, while 26 were randomized to a treatment arm that used tongue depressors to perform stretching exercises.

Main Outcome Measures: Examine the effectiveness of DTS and tongue depressors on improvement of trismus. Examine pretreatment characteristics and determine if any are associated with rate of improvement.

Results: DTS and tongue depressors both significantly increased the maximal intercisal opening (MIO) of patients at three and six months compared to baseline ($p < .01$ in both treatment arms). Patients who received only surgery and no radiation showed significantly more improvement in MIO from baseline to three months ($p = 0.0036$) as well as six months ($p = 0.012$). Improvement between timepoints was not found to be significantly higher between treatment arms.

Conclusions: Both DTS and tongue depressors were able to improve the trismus status for patients but Dynasplint had a higher cost (approximately \$465 per month for DTS and \$12 for 1000 tongue depressors).

Methods and Materials

A total of 53 patients with trismus were enrolled between 2007 and 2013: 27 were randomly assigned to the DTS treatment arm and 26 received TD therapy. The patients underwent measurement of MIO, with subsequent measurements at 3, 6, and 12 months.

Dynasplint uses low-load prolonged-stretch to gradually reduce contracture. A customized mouthpiece was designed for each patient by a Dynasplint® consultant. Patients were instructed on how to properly insert and adjust the device. Patients gradually increased the amount of time spent using the device up to 90 minutes a day in divided sessions.

Tongue Depressor involves patients stacking tongue depressors on top of one another and inserting them into their mouths. Once patients have reached their MIO, they held tongue depressors in place for 30 seconds and performed 5 repetitions up to 5 times a day.



Figure 1. The treatment modalities: tongue depressors (left) and the Dynasplint Trismus System (right)⁽⁴⁾

Results

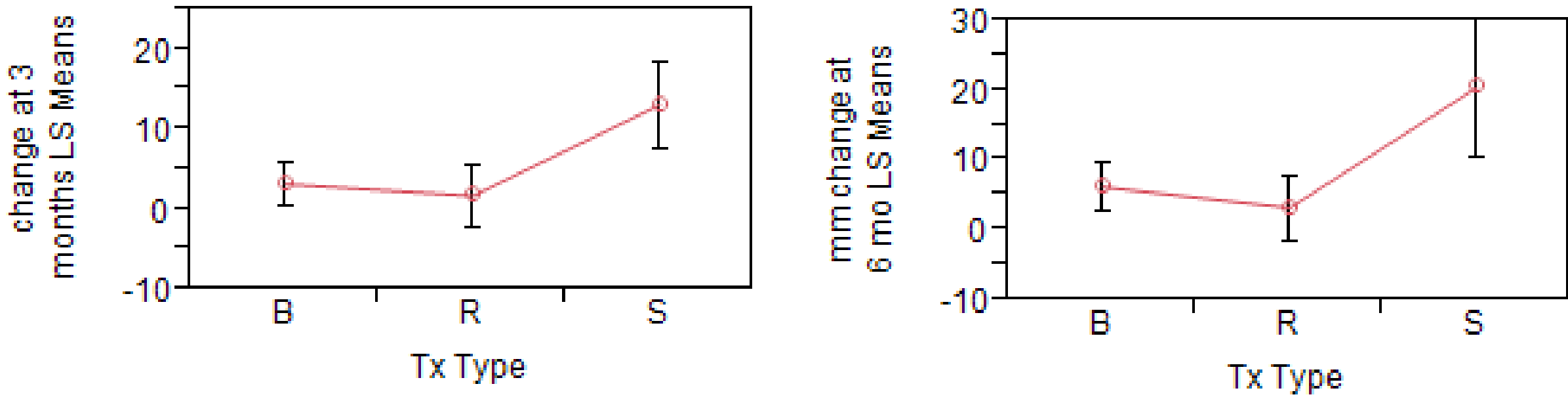


Figure 2. The change in Maximal Incisal Opening (MIO) based on oncologic treatment type. The panel on the left illustrates MIO change at 3 months for radiation and surgery (B), radiation alone (R), and surgery alone (S). The panel on the right illustrates the data at 6 months.

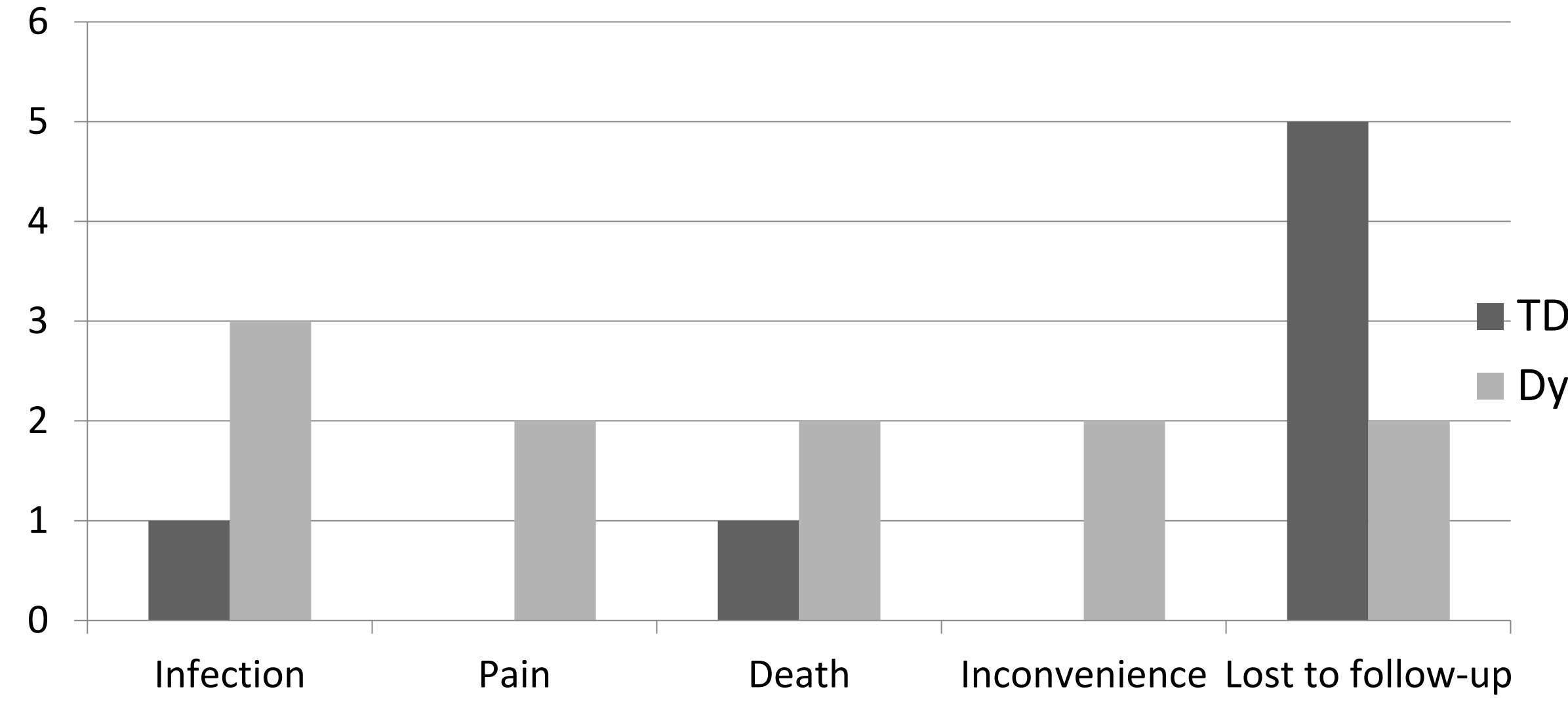


Figure 3. Patients that did not complete the study are listed and categorized by treatment group (Dynasplint (Dyn) or tongue depressor (TD)) and by reason cited for leaving the study.

Discussion

There were improvements in trismus for both groups, averaging 5.85 mm for DTS and 5.97 mm for TD. ($p < 0.01$). The difference between the two groups was not clinically or statistically significant. Patients were also evaluated at both 6 and 12 months, but data is limited due to patient dropouts. Patients who had surgery exclusively to treat cancer gained greater benefit from either DTS or tongue depressors at 3 months ($p = 0.0036$) and 6 months ($p = 0.012$).

Introduction

Trismus, the reduced opening of the jaws, secondary to treatment of head and neck cancer can significantly impair quality of life and lead to difficulty with speech, nutrition, and oncologic follow-up.

Multiple devices and techniques have been shown to improve trismus such as surgical bite-blocks, tongue depressors (TD), interarch springs, Dynasplint®, and TheraBite®. ^(1, 2, 3). The Dynasplint Trismus System (DTS) has shown significant improvement in mean intercisal opening (MIO).

However, there have been no studies comparing DTS to TD therapy. Patient and treatment characteristics predictive of improvement with trismus therapy have also not been defined.

Results

Baseline MIO	Mean (SD)	Median	Range
<u>Dyn</u>	21.20 (5.59)	22	8—35
<u>TD</u>	22.83 (6.43)	22	14.5—37
3 Month MIO			
<u>Dyn</u>	27.05 (7.84)	25	12—43
<u>TD</u>	28.38 (6.21)	28	15—39
3 Mo Change			
<u>Dyn</u>	5.85 (6.17)	4	-7—21
<u>TD</u>	5.56 (6.29)	4	-8—16

Table 1. Baseline and 3 month MIO with 3 month change

Conclusions

Both DTS and TD are effective therapies for head and neck cancer treatment related trismus. Treatment choice should be driven by patient specific such as affordability, comfort, and likelihood of compliance. Patients treated with surgery only had a significantly greater improvement in MIO regardless of treatment modality, likely due to the pathophysiology of trismus secondary to head and neck cancer treatment. Similar improvement indicates that compliance with trismus therapy is more important than the method by which it is delivered. Future studies should address the durability of gains achieved from trismus treatment.

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