Effects of Graston Technique on Soft Tissue Conditions: A Prospective Case Series

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ABSTRACT

Graston Instrument-assisted Soft Tissue Mobilization (GISTM) is a soft tissue diagnostic and therapeutic method which uses stainless steel instruments as an alternative to transverse friction massage. A multi-center prospective case series of 1004 patients treated with using GISTM for various soft tissue conditions is presented. Outcomes assessment data in the domains of quantifying pain, numbness, disability and functional status were collected at initial presentation and at discharge. Health care goals were established at presentation and percent achievement of these goals was evaluated at discharge. These data were compared statistically. Significant improvements in all outcomes analyzed were found. These results suggest that GISTM is an effective treatment for soft tissue conditions, however the lack of control for placebo effect or natural history limit the generalizability of these findings. Randomized controlled clinical trials are currently in the planning stages.

INTRODUCTION

Graston Instrument-assisted Soft Tissue Mobilization (GISTM) is a soft tissue diagnostic and therapeutic method that was developed approximately ten years ago. Originally introduced to the physical therapy profession, GISTM, a key protocol of the Graston Technique has only recently been introduced to the chiropractic profession. Graston instruments were developed as an alternative to transverse friction massage wherein specially designed stainless steel instruments (Figure 1) are used to aid in the diagnosis and treatment of soft tissue dysfunction or pathology. In vitro research with a rat tendon injury model has shown that GISTM significantly activates fibroblasts to both replicate and synthesize.(1, 2) Thus, GISTM appears to increase the amount of fibroblasts and the quantity of collagen deposited, which should speed healing of dense connective tissue like tendon and ligament. The rate of activation has been shown to be proportional to the force applied to tendon.(2) A few case studies have been published about the effects of GISTM treatment on some soft tissue conditions. The purpose of this study is to evaluate the effects of GISTM on a variety of soft tissue conditions in humans in a large case series..

METHODS

A prospective multi-center case series with outcomes analyzed comparing intake with discharge visual analog scale (10 cm long VAS) ratings in four domains:

- ❖Pain
- ❖Numbness
- ❖Achievement of treatment goals
- ❖Function assessed by the health care provider (HCP) in these domains:
  - Activities of daily living
  - Work
  - Recreation

A mean percent composite function level was analyzed. Pain was rated by patients using a VAS with anchors of no pain to most intense pain. Percent numbness was rated by patients on a VAS with anchors of 100% numbness to 0% numbness. Long term treatment goals were established by the patient and HCP at intake. Percent achievement of goals were rated by HCP at discharge on a VAS. Wilcoxon Signed Ranks test, one-way ANOVA, general linear models for repeated measure and Dunnett=s T3 post hoc tests were used to analyze the data set.

RESULTS

Fifty-one clinical sites participated with 1004 patients included in the data set. Conditions treated include:

- ❖Carpal tunnel syndrome
- ❖Cervical pain
- ❖de Quervain's syndrome
- ❖Epicondylitis
- ❖Fibromyalgia
- ❖IT band syndrome
- ❖Joint sprain
- ❖Lower back pain
- ❖Muscle strain
- ❖Painful scar
- ❖Plantar fascitis
- ❖Post fracture pain
- ❖Tendonitis

Patients were treated a mean of 8 treatments/patient, with significant differences (p=0.001) between clinics unrelated to the diagnosis. The highest average treatments per patient was 9 and the lowest was 4 (Figure 2). The mean number of treatments per patient was significantly related to the specific condition, with a high of 10 for low back pain and a low of 5 for iliotibial band syndrome. (Figure 3) There were no significant differences in outcomes between clinics.

For all conditions treated there was a significant decrease in pain (from an initial mean of 4.87 ☐2.55cm to a mean at discharge of 2.11 ☐2.335 cm, p<0.001) (Figure 4) and numbness (from an initial mean 16.07 ☐26.75% to a mean at discharge of 6.65 ☐17.03%, p<0.002), (Figure 5) and increase in function (from an initial function score of 58.45 ☐26.21% to a score of 81.47 ☐21.29% at discharge, p<0.001) (Figure 6). These improvements in condition were generally not related to the patient=s diagnosis. Eighty seven percent of patients achieved at least 50% of their treatment goals, 73% achieved at least 75% of their goals, and 42% achieved at least 90% of their goals (Figure 7). The proportion of patients on full work duty increased from 69% at beginning of treatment to 83% at end of treatment (Figure 8). In addition, the proportion of patients on restricted duty or unable to work due to injury fell from 14% to 10% and 17% to 7%, respectively, at beginning and end of treatment (Figures 8). These results were statistically significant (p < 0.0001).

Figure 1. Complete set of Graston instruments

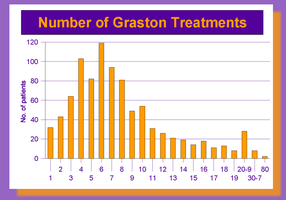

Figure 2. Histogram of amount of Graston treatments for all patients

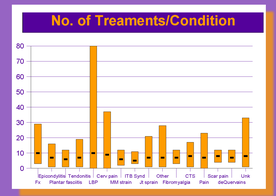

Figure 3. Max, min and average number of treatment per condition

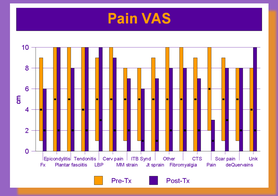

Figure 4. This is a caption place holder for figure 4 which is 6x9" when printed at 200%.

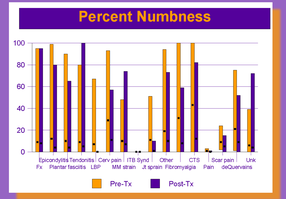

Figure 5. This is a caption place holder for figure 5 which is 6x9" when printed at 200%.

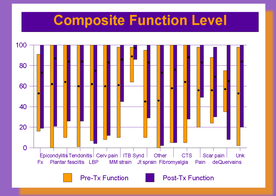

Figure 6. This is a caption place holder for figure 6 which is 6x9" when printed at 200%.

CONCLUSIONS

These results suggest that GISTM appears to be effective in reducing pain, numbness and work related disability and increasing patient's functional ability and thus, is an effective treatment for the variety of soft tissue conditions studied. Obviously, a case series such as this cannot distinguish between the effect of the treatment independent of placebo effect or natural history. Randomized controlled clinical trials are currently in the planning stages.

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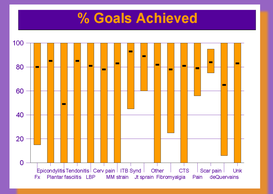

Figure 7. Min, max and mean % treatment goals achieved

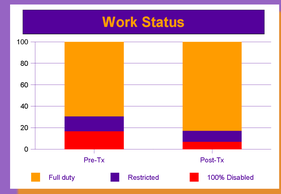

Figure 8. Patient' s work status