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INTEGRATION OF MYOFASCIAL TRIGGER POINT RELEASE AND PARADOXICAL RELAXATION TRAINING TREATMENT OF CHRONIC PELVIC PAIN IN MEN

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ABSTRACT

Purpose: A perspective on the neurobehavioral component of the etiology of chronic prostatitis (CP) and chronic pelvic pain syndrome (CPPS) is emerging. We evaluated a new approach to the treatment of CP/CPPS with the Stanford developed protocol using myofascial trigger point assessment and release therapy (MFRT) in conjunction with paradoxical relaxation therapy (PRT).

Materials and Methods: A total of 138 men with CP/CPPS refractory to traditional therapy were treated for at least 1 month with the MFRT/PRT protocol by a team comprising a urologist, physiotherapist and psychologist. Symptoms were assessed with a pelvic pain symptom survey (PPSS) and National Institutes of Health-CP Symptom Index. Patient reported perceptions of overall effects of therapy were documented on a global response assessment questionnaire.

Results: Global response assessments of moderately improved or markedly improved, considered clinical successes, were reported by 72% of patients. More than half of patients treated with the MFRT/PRT protocol had a 25% or greater decrease in pain and urinary symptom scores, as assessed by the PPSS. In those at the 50% or greater improvement level median scores decreased 69% and 80% for pain and urinary symptoms, respectively. The 2 scores decreased significantly by a median of 8 points when the 25% or greater improvement was first observed, that is after a median of 5 therapy sessions. PPSS and National Institutes of Health-CP Symptom Index showed similar levels of improvement after MFRT/PRT protocol therapy.

Conclusions: This case study analysis indicates that MFRT combined with PRT represents an effective therapeutic approach for the management of CP/CPPS, providing pain and urinary symptom relief superior to that of traditional therapy.

KEY WORDS: prostate, myofascial pain syndromes, relaxation, prostatitis, pelvic pain

Chronic nonbacterial prostatitis/chronic pelvic pain syndrome (CPPS) in men continues to perplex and challenge the urologist in practice. Recently the National Ambulatory Care Survey stated that there may be 20 office visits per 1,000 men yearly compatible with prostatitis complaints and a high prevalence of 5% to 16%.[1,2] In most instances the malady is designated chronic prostatitis (CP) and empirical use of antibiotics represents the mainstay of therapy. However, virtually 95% of chronic prostatitis syndromes in men are nonbacterial and idiopathic, and represent a nonspecific pain disorder.[3] There have been standardized National Institute of Diabetes and Digestive and Kidney Diseases clinical criteria to define CP/CPPS, although no biological markers other than inflammatory leukocytes in expressed prostatic secretion in some men. The importance of inflammation has been called into question as a meaningful finding.[4] The occurrence and persistence of pain described as perineal, testicular, penile and lower abdominal discomfort with or without voiding symptoms is the primary presenting dilemma.

A neurobehavioral perspective to this chronic pain syndrome is now appropriately emerging.[5–7] Pelvic pain manifests as a myofascial pain syndrome, in which abnormal muscular tension could explain much of the discomfort and abnormal urinary dysfunction seen in this disorder.[8,9] Genitourinary disorders such as voiding dysfunction and ejaculatory pain are intimately related to the autonomic nervous system and smooth/striated muscle balance. Any number of acute and chronic stress factors working via the sympathetic endplate may be involved.[10] Some disorders of chronic pelvic pain may be improved with cognitive behavior therapy and biofeedback regimens of relaxation.[7,11,12]

Travell and Simons provided the first manual on trigger points, and myofascial pain and dysfunction.[13] Others have noted the advantages of working with somatic tissue to relieve tension myalgia[14] and Weiss recently reported the successful amelioration of symptoms in patients with interstitial cystitis using myofascial release.[15]

We report our experience as a team of a urologist, a physical therapist and a psychologist to provide urological evaluation, physiotherapy with myofascial trigger point (TrP) release and autonomic and pelvic floor self-regulation using paradoxical relaxation training (PRT) for CP/CPPS.

PATIENTS AND METHODS

Men referred to the urology clinic at Stanford University Hospital with symptoms of CP/CPPS were evaluated and considered for therapy. No specific selection of patients based on the character or distribution of pain was done. Patients with orchialgia and any other distribution pattern of pelvic pain were equally considered for therapy. There were 138 men treated with the myofascial trigger point assessment

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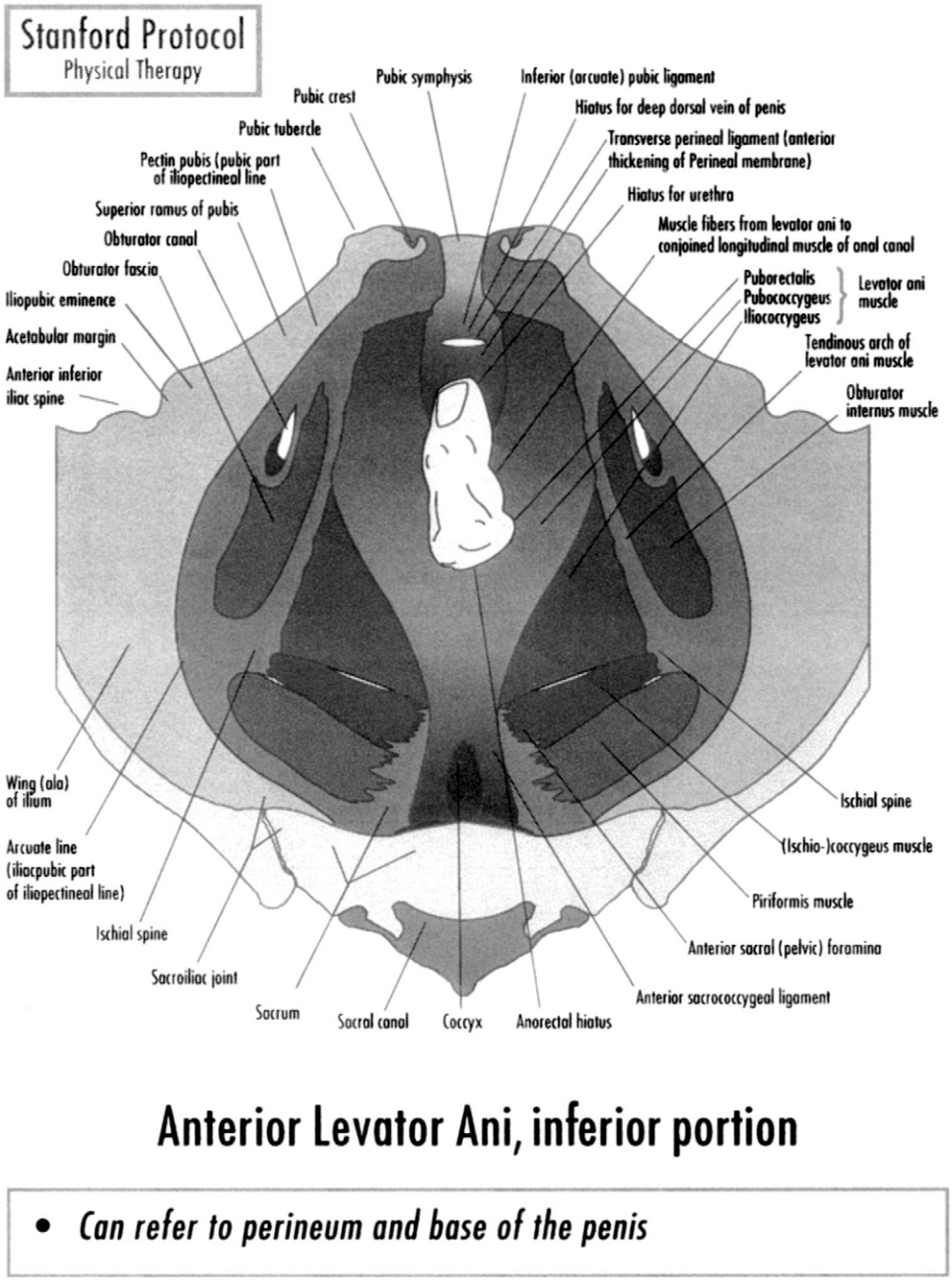
and release therapy PRT (MFRT/PRT) protocol described. Mean patient age was 40.5 years (range 16 to 79). Patients had been diagnosed with CP/CPPS refractory to traditional therapy with a median history of 31 months (range 1 to 354). Symptoms were chronic, intermittent pain, lower urinary symptoms and sexual dysfunction.

Symptom assessments. Prior to treatment and at each followup visit patients completed a pelvic pain symptom survey (PPSS) modified from the survey developed at University of Washington (see Appendix).[16] The survey includes a 10-item pain domain, including a 10-point pain visual analog scale (VAS), a 7-item urinary symptom score identical to the American Urological Association symptom score and a 5-item sexual dysfunction domain. The pain VAS was also used independently for analysis. The PPSS was not validated and it predates the availability of the National Institutes of Health (NIH)-CP Symptom Index (NIH-CPSI).[17] NIH-CPSI surveys were performed in later patients.

MFRT. The patient was examined in the lithotomy position by the urologist to evaluate the prostate, genitalia, external and internal pelvic muscles, and myofascial TrPs. Traditional prostate massage was performed to assess expressed prostatic secretion for inflammatory conditions and bacterial involvement. Positive myofascial TrPs induce pain on palpation that tends to reproduce symptoms at the site or referred to a nearby anatomical location.[13] For example, myofascial TrPs in the anterior levator ani muscle often refer pain to the tip of the penis. The levator endopelvic fascia lateral to the prostate represents the most common location of TrPs in men with pelvic pain. The physiotherapist applied treatment with the patient in the prone and lateral positions with a cushion under the abdomen. The right hand was used to examine and work the left side of the pelvic floor and the left hand was used to work the right side of the pelvic floor (see figure). Individual muscle groups were palpated, myofascial TrPs were identified and pressure was held for about 60 seconds to



Internal pelvic musculature and digital myofascial release technique

release. Specific physiotherapy techniques used in conjunction with MFRT were voluntary contraction and release/hold-relax/contract-relax/reciprocal inhibition, and deep tissue mobilization, including stripping, strumming, skin rolling and effleurage. This physiotherapy was prescribed weekly for 4 weeks and biweekly for 8 weeks thereafter.

PRT. In conjunction with physiotherapy a fundamental aspect of the protocol is PRT, which is a method of autonomic self-regulation and pelvic muscle tension decrease. Patients received 1 hour of individual verbal instructions and a supervised practice session at weekly intervals for 8 weeks in progressive relaxation exercises devised by Wise and Anderson to achieve specific profound relaxation of the pelvic floor.[10] The word paradoxical is used because patients are directed to accept their tension as a way of relaxing/releasing it. Components of the training included a specific breathing technique to quiet anxiety and relaxation training sessions directing patients to focus attention on the effortless acceptance of tension in specific areas of the body. Daily home practice relaxation sessions of 1 hour were recommended for a minimum of 6 months using a series of 36 instructional lessons (7 to 42 minutes each) to accomplish the incremental relaxation of residual tension in specific body areas, aimed at simultaneous relaxation of the pelvic floor.

Patients who participated in the MFRT/PRT protocol even on a limited basis were analyzed to report an overall clinical outcome. Response to therapy was defined as 25% or greater improvement (decrease) in symptom score. At the conclusion of treatment patients reported their perception of the overall effect of the protocol using a 7-point global response assessment (GRA). The responses were markedly improved, moderately improved, slightly improved, no change, slightly worse, moderately worse or markedly worse.

Statistical analyses. Statistical tests were done for all evaluations using SPSS software, version 11.5 (SPSS, Chicago, Illinois). Differences between pretreatment and posttreatment scores for total pain, urinary symptoms and pain VAS on the PPSS, and the total NIH-CPSI score and individual domains of the NIH-CPSI questionnaire were analyzed with the paired samples t test method. A comparison of responses in pelvic pain, urinary symptoms and pain VAS scores among patient reported GRA categories was analyzed with the independent sample t test method. Statistical significance for all tests was considered at $p < 0.05$.

RESULTS

Combined therapy with myofascial TrP release and PRT provided symptomatic relief of CPPS in traditional treatment refractory patients, including many with long-standing disease. Between February 1996 and June 2004, 138 patients completed at least 1 month of therapy and followup (median 4 months, range 1 to 60). Table 1 shows PPSS pretreatment and posttreatment results. Approximately half of the patients treated with MFRT/PRT had clinical improvements associated with a 25% or greater decrease in all symptom scores. In the 37% to 39% of patients who achieved 50% or greater improvement median scores decreased 69% and 80% for total pain and urinary symptoms, respectively. The number of treatments was variable in this population case study. Some patients had rapid responses to therapy occurring as early as after 1 week of treatment and they continued to improve further or remain the same, while others received intermittent therapy as needed throughout recurrent CPP episodes. A total of 95 patients (69%) had clinical improvements in pain during the treatment course. The total pain score of 13 before treatment decreased a median of 8 points (range 3 to 18) at the time when 25% or greater improvement was first observed. This occurred after a median of 5 MFRTs (range 1 to 30). Of these patients 69.5% (66 of 95) achieved pain score decreases exceeding the 50% improvement level after a median of 3.4 months of therapy. Urinary symptom improvements and the number of treatments needed to achieve responses were similar to those for pain improvement. Patients with no change or worsening scores received a median of 8 treatments (range 1 to 20).

A total of 128 subjects (93%) answered the sexual function questions of the PPSS and the other 10 left blanks. No pretreatment dysfunction (score 0 of 20) was noted by 14% of patients (18 of 128). Of the remainder 63% (69 of 110 patients) had 25% or greater improvement in sexual function; although most (56) achieved a 50% or greater response after MFRT/PRT.

Patient reported GRA ratings of markedly improved and moderately improved were what we considered clinical success. Table 2 shows the association between GRA category, and improvements in total pain and urinary scores, and pain VAS scores. The GRA questionnaire was introduced after the first third of patients (46) had been treated, although it was completed by all subsequent 92 (67% of a total of 138 total). Overall 72% of patients reported marked (46%) or moderate (26%) improvement after therapy. Pain scores significantly decreased a median of 8 points in those with marked improvement (paired samples t test $p < 0.001$) and 3.5 points for moderate improvement ($p = 0.001$). Urinary symptoms scores also significantly decreased a median of 3.5 points in patients reporting marked improvements ($p < 0.001$) and decreased approximately 20% in those with moderate improvements, which was not significant ($p < 0.067$). Pain VAS scores

TABLE 1. *Improvements in pain and urinary symptom scores, and pain VAS (PPSS) after MFRT/PRT*

Clinical Improvement Level	Median Pretreatment Score (range)	No. Pts (%)	Median % Score Change
Total pain:	13 (3–30)	138	
50% or Greater		54 (39)	−69
25% or Greater–49%		27 (20)	−38
Less than 25%		22 (16)	−17
No change		6 (4)	0
Worse		29 (21)	27
Pain VAS:	4 (0–10)	136	
50% or Greater		49 (36)	−67
25% or Greater–49%		28 (21)	−33
Less than 25%		13 (10)	−14
No change		15 (11)	0
Worse		31 (22)	50
Urinary:	8 (0–27)	138	
50% or Greater		51 (37)	−80
25% or Greater–49%		19 (14)	−39
Less than 25%		15 (11)	−14
No change		25 (18)	0
Worse		28 (20)	60

TABLE 2. *Patient reported GRAs and improvements in PPSS after MFRT/PRT in 92 patients*

GRA Category*	No. Pts.	Median Pretreatment Score (range)	Point (range) Change	p Value (paired samples t test)	No. Pts Clinically Improved (%)	
					25% or Greater	50% or Greater
Markedly improved:	42					
Total pain		13 (2–29)	−8	<0.001	35 (83)	27 (64)
Urinary		8 (0–27)	−3.5	<0.001	24 (57)	20 (48)
Pain VAS		4 (0–9)	−2	<0.001	35 (83)	25 (60)
Moderately improved:	24					
Total pain		14.5 (5–27)	−3.5	0.001	12 (50)	5 (21)
Urinary		6 (0–20)	−1	0.067	9 (38)	8 (33)
Pain VAS		5 (0–9)	−1	0.088	13 (54)	5 (21)
Slightly improved:	7					
Total pain		11 (4–29)	3	0.596	—	1 (14)
Urinary		11 (0–20)	−2	0.165	2 (29)	1 (14)
Pain VAS		3 (0–9)	1	0.334	—	1 (14)
No change:	18					
Total pain		11 (2–21)	0	0.358	4 (22)	3 (17)
Urinary		11 (0–19)	−1	0.077	—	7 (39)
Pain VAS		4 (0–10)	0	0.404	6 (33)	3 (17)

* GRA was moderately worse in 1 patient.

significantly decreased a median of 2 points in the markedly improved group ($p < 0.001$).

Table 3 shows a comparison between the 2 highest clinically relevant GRAs, and NIH-CPSI and PPSS symptom scores. Total NIH scores (median 24 before treatment in 85 patients surveyed) significantly decreased a median of 10.5 points (paired samples t test $p < 0.001$) and 6.5 points ($p = 0.008$) in the markedly and moderately improved groups, respectively. All NIH domains had significantly improved scores in the markedly improved category ($p < 0.001$ to 0.011) and except for the urinary domain ($p = 0.103$) there were significantly improved scores in the moderately improved category. PPSS showed similar improvements.

Patients typically experienced some increase in discomfort after the first MFRT therapy session but then progressed to improvement rapidly thereafter. No patient refused to continue therapy because of discomfort.

DISCUSSION

Lacking a convincing pathophysiological basis for cause,[18] physicians are left with treating the unfortunate men with CPPS with multimodal therapy. The National Institute of Diabetes and Digestive and Kidney Diseases urology section is devoting considerable effort and funding to field and sponsor reasonable, evidence based therapy trials. Neurobehavioral disorder with pelvic floor tension has frequently been suggested as a potential etiological basis for CPPS.[6,8,9] Biofeedback therapy is an example of recent direct approaches to pelvic floor dysfunction.[7] Most patients are found to have tenderness in the pelvic muscles around the prostate and in the anterior pelvis on digital rectal examination.[9] It is postulated that nociceptive nerve endings and receptors allow endogenous pain producing phenomena, which may represent a neuroinflammatory condition.[18] It has been further noted that many men are documented to have pseudodyssynergia of the internal and external urinary sphincter mechanisms associated with CPPS.[19]

Myofascial pain syndrome is extremely common and it involves a wide spectrum of bodily disorders and diseases. To our knowledge the internal pelvic tissue associated with the pelvic organs has not been considered as a source of pain and the concept of pelvic TrPs is new to the practice of urology. A myofascial TrP is defined as a hyperirritable, sensitive spot, usually within a taut band of skeletal muscle or fascia. Electrophysiological studies suggest active loci within dysfunctional extrafusal motor endplates. Specific psychological stress can induce abnormal electromyographic activity.[20]

Pathways in neurogenic inflammation, especially between the central and peripheral nervous and endocrine systems with effects on immunomodulatory mechanisms, will most likely provide a pathophysiological explanation for CPPS. It seems intuitive that central sensitization probably represents the basis for hyperalgesia and allodynia in many of these men.[6,12] We must await elucidation of these biochemical pathways and develop an understanding of the role of proinflammatory and other cytokines. Our treatment modality is based on the psychophysiological explanation of painful muscle TrPs being initially activated by infection, trauma or emotions. Our protocol includes the release of myofascial TrPs, which tends to recreate patient symptoms and behavior modification to relax profoundly the pelvic muscles and modify the habit of focusing tension in the pelvic floor while under stress. This is not a quick fix and it relies on critical cooperation and effort from the patient as well as on extensive labor on the part of the therapists. Our premise is that, in addition to releasing painful myofascial TrPs, the patient

TABLE 3. *PPSS and NIH-CPSI scores after MFRT/PRT in patients with markedly and moderately improved GRAs*

Response Measure	Markedly		p Value (paired samples t test)	Moderately		p Value (paired samples t test)
	Median Pretreatment Score	% Decrease		Median Pretreatment Score	% Decrease	
PPSS:						
No. pts	42			24		
Total pain domain	12	−59	<0.001	14.5	−25	0.001
Urinary domain	8	−42	<0.001	6	−15	0.067
Pain VAS	4	−62	<0.001	5	−25	0.088
NIH-CPSI:						
No. pts	32			18		
Total score	24	−46	<0.001	24	−24	0.008
Pain domain	12	−35	<0.001	12	−27	0.015
Urinary domain	3	−35	0.011	3	−6	0.103
Life quality	9	−44	<0.001	9	−25	0.039

must supply the central nervous system with new information or awareness to progressively quiet the pelvic floor. The patient moves from being a passive, helpless victim to an active participant/partner in healing.

This report has several obvious limitations. It is not a prospective study and no randomization to other therapy or placebo control was attempted. Patients were not standardized with regard to the frequency and duration of physiotherapy sessions or to adherence to daily progressive relaxation exercises. A nonvalidated PPSS was initially used to assess all patients and the NIH-CPSI instrument was added when it became available. However, the NIH-CPSI and PPSS reflected similar levels of patient improvements achieved with MFRT/PRT.

Our latest protocol design has corrected some earlier problems. We now treat patients in a 6-day, 30-hour program held off site. Patients spend 5 to 7 hours daily in paradoxical relaxation training and myofascial TrP release physical therapy. This immersion program facilitates decreasing sympathetic arousal, quieting catastrophic thinking and releasing internal and external pelvic TrPs, and areas of muscle restriction. There is time to ensure adequate training in pelvic floor relaxation and hands-on self-help physical therapy instruction. The preliminary results from more long-term followup in several patients leads us to believe that these levels of pain/symptom reduction may continue to increase with continued home application of our protocol.

CONCLUSIONS

This case study analysis indicates that the MFRT/PRT protocol was successful in producing a 72% moderate/marked improvement in subject symptoms and it may be an effective treatment approach in patients with CP/CPPS, providing pain and urinary symptom relief with the least downside risk. The treatment that we describe is based on the new understanding that certain chronic pelvic pain reflects a self-feeding state of tension in the pelvic floor, perpetuated by cycles of tension, anxiety and pain. Our treatment protocol aims to rehabilitate the pelvic floor, while simultaneously modifying the habit of focusing tension under stress.

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APPENDIX: PPSS FOR MEN

Over the past month or so, including today, how much were you bothered by the following:

	Not at All	A Little Bit	Moderately	Quite a Bit	Extremely
Pain in the lower back	0	1	2	3	4
Pain in the lower abdomen or pubic area	0	1	2	3	4
Pain during urination	0	1	2	3	4
Pain with bowel movement	0	1	2	3	4
Pain in the rectum	0	1	2	3	4
Pain in the prostate gland	0	1	2	3	4
Pain in the testicles	0	1	2	3	4
Pain in the penis	0	1	2	3	4
Number of days pain experienced in the last month*	0	6	15	24	30
How bad is the pain on average? (Put an X on the line from 0 to 10)†	0				10
	no pain				most painful
				Total Pain Score _____	
Difficulty postponing urination, hard to hold (urgency)	0	1	2	3	4
Need to urinate again less than 2 hr after urinating (frequency)	0	1	2	3	4
Number of times urinating at night	0	1	2	3	4
Bladder does not feel completely right after urinating	0	1	2	3	4
Stopping and starting several times while urinating (intermittence)	0	1	2	3	4
Weak urinary stream	0	1	2	3	4
Having to push or strain to begin urination	0	1	2	3	4
				Total Urinary Score _____	
Lack of interest in sexual activity	0	1	2	3	4
Difficulty getting an erection	0	1	2	3	4
Difficulty maintaining an erection	0	1	2	3	4
Difficulty reaching an ejaculation	0	1	2	3	4
Pain with ejaculation	0	1	2	3	4
				Total Sexual Score _____	

* The approximate number of days pain was experienced is scored in increments and is associated with a severity category for scoring (e.g., 15 days of pain represents moderate severity and is scored as a 2).

† The 10-point visual analog scale score was used alone as the *pain VAS*, but the score was also incrementally included in the Total Pain Score. That is the X mark on the line was scored as 1 of the 5 categories ("Not at All" through "Extremely") based on its position on the line.

The maximum total pain score is 40, maximum total urinary score is 28, and maximum sexual score is 20.

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