QRS 1010 Pelvicenter

Repetitive peripheral magnetic stimulation to correct functional pelvic floor disorders

Scientific documentation and medical information

Men - Pelvic Pain Syndrome

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definition

Hardly any other clinical picture leads to an orthopedist as often and is misinterpreted as often as pain syndromes of the musculoskeletal system. The “pubic bone inflammation” stands out here in particular. But also the pelvic pain syndrome, postpartum pain or the peritrochanteric pain that is often “diagnosed” as osteoarthritis of the hip seem to be somehow mysteriously connected. However, if one sees the pathomechanism of a myofascial syndrome behind it, important connections and thus therapy options open up.

Epidemiology and Prevalence

Osteitis pubis OB (pubic bone inflammation)

The frequency of OB in amateur and professional sports is between 0.5 and 7.0% [1] , [2] , [3] , [4] , [5] . Although every sport is affected by OB (e.g. long-distance runners [6] , [7]), it is much more common in sports with sprinting and kicking elements or quick changes of direction (soccer, American football, ice hockey, tennis and rugby) [8]. , [9] , [10] , [11] .

In soccer players, the prevalence ranges up to 58% [12] , [13] . The disease, which was almost completely unknown in the past, is booming in modern football and is seen there as a "bogeyman" [14] . It is true that three quarters of all pubic bone infections do not go beyond stage 1 and take an average of 26.7 days to heal [15] . In addition to these "spontaneous" healing processes, however, long-lasting complaints that can last several months [16] and lead to long-term interruptions in training and competitions are not uncommon [17] , [18] .

Pelvic Pain Syndrome

The CPPS in men, which differs from that in women and cannot be easily distinguished from prostatitis symptoms / LUTS in terms of differential diagnosis, the prevalence data collected range from 2.7 to 13.8% [19] , [20] , [21] , [22] , [23] , [24] .

Peritrochanteric Pain Syndrome (GTPS)

With a prevalence of 10 to 25%, the peritrochanteric pain syndrome (GTPS) is surprisingly one of the most common pain syndromes in orthopedics [25] . This may also be related to the fact that it was misinterpreted as trochanteric bursitis for a long time [26] , [27] because no connection to a muscular disease was seen. If deep back pain is also present, the prevalence is even 20 to 35% [28] .

If one were to add coxarthrosis, which affects 14% of people over the age of 55 according to radiological criteria, but only 5% actually show clinical symptoms [29] , the number of GTPS cases could be even higher. At the age of >65 there are hardly any people who can avoid degenerative changes in the hips [30] and the prevalence varies between 50 and 80% [31] , [32] , [33] .

physiology

The importance of myofascial tissue, which is defined as a complex of muscles (myo) and the surrounding connective tissue (fascia), is of great relevance in orthopedics [34] . It is estimated that more than half of all orthopedic patients are affected by myofascial pain syndrome [35] , [36] . Similar to chronic back pain, which is considered non-specific in 85 to 90% of cases and which is caused by malfunction and tension in the muscles (“myofascial syndrome”) [37] , [38] , [39] , [40] , expresses itself Inflammation of the pubic bone suspiciously with comparable symptoms.

The hypothesis of an endplate dysfunction is discussed for the myofascial syndrome [41] , [42] , [43] , [44] , [45] , [46] , [47] , [48] , with the controversial discussions continuing to this day [49] , [50] , [51] . Overloading and traumatic overstretching of a muscle, which cause a subliminal permanent polarization of muscle fibers, are said to be the cause here [52] . This causes calcium depletion in the sarcoplasmic reticulum, resulting in a local muscle contracture [53] , [54] , which can be felt as a contracture node (trigger point). The associated local circulatory disturbance ("vascular compression") creates a vicious circle after a spastic muscle stimulates pain receptors, causing it to reflexively contract even more [55] . A further complication is the increased energy requirement of the myofascial nodes, which cannot be satisfied under the ischemic conditions [56] .

Transferred Pain

In these causal cascades, the "transferred pain" is of particular importance because it explains why local therapeutic efforts often lead to frustrating results. It is postulated [57] that the source of pain is often not to be found in the pain area, but in more or less distant muscles and joints. "Silent synapses" in the posterior horn of the spinal cord ("pain afferents") are said to be activated by the diffusion of neurotransmitters from neighboring neurons, so that the pain unfolds in their projection area [58] , [59] , [60] .

Myofascial Chains

While the term fascia used to be much narrower, today it includes any collagenous tissue. This is interspersed with many mechano- and pain receptors and mediates so-called "anatomy trains": Fascial tissue then provides a direct connection to the individual components of the movement system, so that longitudinal tension and force transmission takes place [61] , [62]. . There are said to be 11 myofascial chains alone, each of which runs on the front and back of the body and sometimes even spirals around the entire body [63] . In addition, there is also the concept of a "tensegrity": According to this, the activation of one component always has an impact on neighboring structures, whereby this is to be imagined as a flexible connection (myofascium) with solid parts (bones) [64] . Muscles therefore do not act separately from one another, but in combination with the help of the facial tissue, so that local changes always result in a mechanical transmission to neighboring body regions.

pubic inflammation

The somewhat misleading addition “inflammation” is based on a bacterial disease of the pubic bone after gynecological or urological operations that is hardly relevant today and describes a painful, non-infectious inflammation of the pubic symphysis or the pubic bone and adjacent structures [65] . It is said to be caused by highly repetitive strain on the adductors of the thigh and possibly the abdominal muscles (m. rectus abdominis). Whether this is due to bone edema (bone bruise) that can only be diagnosed by MRI is rather doubtful, since such cases usually involve a direct injury (e.g. cruciate ligament, ankle) and such an injury is not necessarily associated with pain [66] .

If it is the case - as one study claims - that myofascial trigger points, e.g. of the gluteus maximus and medius, primarily produce local pain in the gluteal and sacral region, those of the gluteus minimus muscle on the lower extremities or ankles and those of the pelvic floor muscles mainly in the Pelvic region [67] , it seems likely that both hardening at the muscle insertions and pain that is transmitted through myofascial chains play a role here. In this respect, osteitis pubis does not differ from insertion tendinopathy and can therefore also be aptly described as “tennis elbow” of the pubic bone [68] . In any case, the symptoms consist of groin pain and pain during isometric adduction of the leg with the hip joint extended or flexed (lift-up test).

Pelvic Pain Syndrome

In 1995, the symptoms previously diagnosed as "prostatitis" were given the name "Chronic Pelvic Pain Syndrome (CPPS)" - i.e. after it could no longer be denied that 90 to 95% of all those affected did not suffer from a prostate infection [69] . This corresponds to a category III in the classification of prostatitis, which is otherwise systematized with I. acute, II. chronic bacterial and IV. asymptomatic inflammatory prostatitis.

Due to the very variable clinical picture, however, CPPS is often not recognized [70] and should therefore ideally be identified by means of exclusion diagnostics [71] . Typically, there is pain in the deep abdomen, in the perineum, in the testicles and in the penis, whereby irritation of the bladder such as residual urine, dysuria and pollakiuria can also belong to the syndrome complex [72] . Stress also suspiciously intensifies the symptoms [73] , whereby the patients often suffer more from the functional symptoms than from the pain situation [74].

According to the official interpretation, the etiology is largely unknown - which may also be due to the fact that in ignorance or rejection of a myofacial event, the mostly present trigger points of the various tendon attachment points as well as increased pelvic floor tone and increased reflex activity are usually not the focus of diagnostics [75] , [76] , [77] . The evidence seems to be substantial after a study on CPPS (103 men) showed 92.2% of men with pelvic floor dysfunction [78] and physiotherapy with comparable symptoms proved to be effective and sustainable [79] .

The extent to which a solely “regional” pain syndrome can be assumed here [80] seems doubtful, especially since successes in physiotherapeutic treatment of the temporomandibular joints (“teeth grinding”) [81] are reminiscent of the myofascial chains already mentioned. In the meantime, there is increasing evidence that there is a connection between temporomandibular joint disorders (TMJA Temporomadibular Joint Disorders) and other pain syndromes such as migraine, endometriosis,

fibromyalgia, interstitial cystitis, vulvodynia or CPPS and therefore actually a CCPC syndrome (Comorbid Chronic Pain Conditions). be [82] .

Peritrochanteric pain syndrome

Because of the lack of signs of inflammation, the pain syndrome previously treated as bursitis (trochanteric bursitis) was renamed GTPS (Greater Trochanteric Pain Syndrome) [83] , [84] , [85] , [86] . In most cases, a tendinopathy from the gluteal area (M. glutaeus medius or minimus) is behind it, although the actual cause remains unclear [87] . The pain usually runs laterally or dorsally to the greater trochanter in the direction of the gluteal muscles and sometimes extends to the lateral thigh and even the knee. There is pronounced pressure pain and an increase in symptoms after exertion.

QRS Pelvicenter rPMS effect

A number of studies have already been indexed on the effectiveness of rPMS in myofascial pain syndromes [88] ("trapezius muscle [89] , [90] , [91] , vastus lateralis muscle after TEP [92] , back pain [93] , neck muscles [94] , other local muscle pain [95] , [96] ") although the underlying mechanism of action still remains unclear [97] . Statements such as "pain relief, myostimulation, myorelaxation, decongestant effect or an improvement in blood flow" [98] say little about why a muscle contracture with nodule formation should regress under rPMS use.

The assessment that central mechanisms ("proprioceptive afferents") play a role in pain regulation [99] , [100] also ignores the pathogenesis of myofascial trigger points. Possibly no distinction is made here between muscle pain and a malfunction of the peripheral or central nervous system [101] . Studies on rPMS in chronic back pain [102] , [103] , [104] , for example, speak of immediate pain relief in 3 out of 4 studies .

Acute back pain should also respond to rPMS with immediate pain relief, which is also lasting [105] . However, this cannot be explained solely by the gate control theory discussed elsewhere. It may be assumed that a muscle contracture follows the impulse of an additive strengthening contraction, ie that relaxation can only be initiated through active tension.

This approach is based on experiments on isometric muscle contraction against resistance that produced immediate pain relief in 94% of subjects and sustained pain relief in 63% [106] . This is also confirmed by another study, according to which, for example, a myofascial trigger point can be better treated with electrical stimulation than with a local anesthetic [107] .

Scope of treatment and duration of therapy

Derived from the study situation, 8 to 10 treatments are to be regarded as expedient. There is disagreement about the frequency, since the gate control theory also plays a role here. However, it is important to remember that muscle tetanus (frequency > 20 Hz) serves to strengthen the muscle [108] , [109] , while a frequency < 20 Hz is the better choice to induce a single muscle twitch or muscle relaxation [110] . This results in the recommendation to use a frequency of 15 Hz to 20 Hz.

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expectation of success

Although consistently significant results can be achieved with regard to pain relief (CPPS), no measure of effectiveness can be derived from this. Because the stimulus configurations used there of 40 to 50 Hz or 10 Hz + 50 Hz actually ignore the pathophysiology of a myofascial syndrome. With a suitable choice of frequency, an optimization of the result should therefore be expected.

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study situation

Study 1: prospective, randomized and placebo-controlled double-blind study [111]

21 men with an average age of 47.8 years (25 to 67 years) received an rPMS application twice a week (15 minutes at 10 Hz / 15 minutes at 50 Hz) over a period of 4 weeks (8 treatments).

Result:

The mean symptom score had decreased significantly in the active group at both 3 months and 1 year ($p<0.05$). The best result was achieved for pain symptoms. There was no change in the placebo group.

Study 2: 46 men with CPPS with or without urination problems [112]

46 men with CPPS with or without urinary problems who had not previously responded to any drug therapy were treated with a total of 12 rPMS applications within 6 weeks.

Result:

At 6 months, NIH CPSI score decreased from baseline 25.0 +/- 6.9 to 15.6 +/- 7.7, pain score decreased from 11.8 +/- 3.7 to 6.9 +/- - +/- 4.7 (all $p<0.05$). With regard to benefit, satisfaction and motivation, > 70% gave a positive response in all subdomains in the BSW Questionnaire (Benefit, Satisfaction and Willingness). Patient satisfaction PPSI (Patient Perception of Symptoms Improvement) was also good after 6 months.

Study 3: 51 patients with LUTS and CPPS [113]

51 patients with LUTS and CPPS received a total of 8 rPMS applications (40 Hz for 10 minutes / 2 minutes rest / 50 Hz for 10 minutes).

Result:

The therapy was completed by 40 patients without absenteeism. 25 of the 40 patients (62.5%) achieved a 30% improvement in their LUTS symptoms. The NIH-CPSI score (NIH-Chronic Prostatitis Symptom Index) decreased from 22.4 to 15.6 ($p<0.05$). The pain score fell from 9.0 to 6.2, voiding problems from 6.7 to 4.8, quality of life from 6.6 to 4.5. In addition, 11 of 26 patients (42.3%) had at least a 15% improvement in sexual performance. Here the HEF score (International Index of Erectile Function) improved from 44.1 +/- 13.5 to 51.6 +/- 11.3 ($p < 0.05$).

Study 4: prospective study with 14 CCPS patients [114]

14 CCPS patients received rPMS applications twice weekly over a period of 4 weeks.

Result:

The mean scores (NIH-CPSI) of 4 patients were evaluated. Both the total score ($p < 0.01$) and the sub-area pain or discomfort ($p < 0.02$) decreased significantly. However, there was no significance for the score for micturition ($p = 0.20$). The quality-of-live score increased slightly ($p=0.05$).

Study 5: 30 CPPS patients (average age 39.3 years) [115]

30 CPPS patients (Ø age 39.3 years) received an average of 10.5 rPMS applications with 10 minutes at 40 Hz, pause 2 minutes, 10 minutes at 50 Hz (on-off 5 s: 5 s).

Result:

Twenty of the 30 patients (66.7%) had at least a 30% improvement in symptoms. The total NIH-CPSI score improved significantly from 23.7 to 15.2 ($p<0.01$). The pain score fell from 11.37 to 6.77, voiding problems from 5.03 to 3.27 and the QOL score from 7.27 to 5.17. In the patients who responded positively to the treatment, the achieved result was maintained in 72% of the patients even 3 months after the end of the therapy.

Study 6: prospective, randomized double-blind study [116]

20 men (Ø 47 years) with CPPS who had failed drug therapy were treated with rPMS for 4 weeks (twice a week) (15 minutes at 10 Hz, 15 minutes at 50 Hz). To cover up the ineffectiveness of the sham device, the sound of the active device was played.

Result:

At 3 months (follow-up), 62% of patients had responded successfully to treatment - vs 13% in the placebo group. After 1 year, the previously achieved result was still valid for 57% of the active and 20% of the placebo group. The pain score (VAS) was 22.7/50 in the active group and fell by 50% to 11.4/50 at 1 year. There was no change in the placebo group (20.4/50 baseline) or increased to 24/50 after one year.

summary

It is becoming increasingly clear that behind most pain syndromes of the musculoskeletal system (back, arthroses, tendinopathies) and thus also of the pelvis there is a myofascial development. Inflammation, cartilage degradation in a joint or dehydration of the intervertebral disc are therefore to be seen as a consequence and not as the cause of the associated restriction of movement or poor posture.

In a differentiated consideration of a myofascial syndrome of the pelvis, the cause of the "pubic bone inflammation", which only occurs in athletes, may be a protective reflex reaction after overloading the adductors or an abdominal muscle inserting into the pubic bone.

If one ignores psychosocial reasons, a CPPS or a peritrochanteric pain syndrome - similar to a tennis elbow - can also arise out of "nothing". If the dominant pathology of a myofascial syndrome consists of muscle hardening or contraction blockage due to interspersed painful trigger points, this region is the therapeutic target area.

It can be assumed that so-called myofascial function chains exist, which reach from the muscle insertions of the occipital bones (Os occipitale) or from the jaw joint down to the ankle, making the location of the pain origin questionable. On the other hand, there is evidence that the majority of pelvic pain syndromes are closely related to the muscles and fascia of the pelvic floor [117] .

There is a manageable body of studies on rPMS in pelvic pain syndromes. Due to the universality of myofascial syndromes, however, it seems legitimate to transfer them to other myofascial-related indications of the pelvis. However, the usual frequency settings for stress and urge incontinence are not to be used here, but a stimulus configuration that is suitable for inducing muscular relaxation via individual twitches.

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