

PSYCHOLOGICAL FACTORS IN UPPER EXTREMITY SURGERY

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Human response to disease varies considerably. For example, among patients with degenerative arthritis of the wrist or the base of the thumb, some are incapacitated by relatively mild disease, while others with few complaints are noted to have marked destruction of the joint as an incidental finding on radiographs taken for some other reason. To emphasize these variations, it has been suggested that the term “disease” be used to refer to the pathophysiology, while “illness” includes all of the cultural, psychological, and situational influences on a patient’s experience of the disease.

The spectrum of responses to disease extends from the injured worker in a dispute over compensation that may be disabled from minor symptoms, to the driven athlete that wants to continue playing with a broken bone. The motivations and influences on a patient are not entirely conscious and there are at least a few musculoskeletal conditions that are actually psychiatric illnesses such as the clenched hand syndrome and factitious disorder. Most people fall somewhere on the spectrum and have some more adaptive and some less adaptive psychological influences on illness. These psychological influences may have a greater effect on the results of treatment than the type of surgery or implant used or the skill of the surgeon or therapist, and therefore merit careful study.

PSYCHOLOGICAL FACTORS IN MUSCULOSKELETAL ILLNESS

POST TRAUMATIC STRESS DISORDER (PTSD)

The events that lead to hand injuries can be traumatic not only physically, but also psychologically. Many severe hand injuries are the result of violent accidents with machinery or tools. Motor vehicle accidents and physical assault can also be life-changing events. Patients surviving these types of traumas may have stressful episodes in which they re-experience the event in nightmares or intrusive memories. They may avoid

reminders of the event such as associated locations, people, and activities. Symptoms of increased arousal, such as outbursts of anger or difficulty concentrating or sleeping can occur. In severe cases these reactions represent Posttraumatic Stress Disorder (PTSD).

Developing PTSD after a hand injury may negatively influence recovery (1). Because the injured hand is itself a reminder of the trauma, patients may be hesitant in their rehabilitation and avoid reincorporating the limb into functional tasks. If the injury occurred at work, patients often avoid the job site and tasks, so returning to work is difficult. Depressed mood often accompanies PTSD and can further dampen patients’ recovery (2). Grunert and his colleagues found that most patients recovering from severe traumatic hand injuries develop at least one symptom of PTSD, and the symptoms often continue eighteen months after the injury (3). Studies of general trauma patients provide evidence that symptoms of PTSD predict poorer subjective functional outcomes (4-6).

Future studies of the influence of PTSD on the recovery from traumatic injuries should use accepted measures and definitions for diagnosis of PTSD because the symptoms can overlap with normal responses to injury. The timing of assessment of PTSD is also important. To be officially diagnosed with PTSD, the symptoms must persist for at least a month. Since the critical period for optimal rehabilitation from a hand injury is the first few months after the injury, the relationship to recovery of physical function may depend upon the responses to trauma early on. The influence of the trauma on the patient’s perception of the outcome, continued symptoms, and overall health status is probably better assessed more remote from the injury.

ANXIETY ABOUT PAIN: THE FEAR-AVOIDANCE PROBLEM

Anxiety about pain varies substantially. It has been suggested that responses to pain anxiety lie between two extremes: confrontation and avoidance. People who actively confront their anxiety (e.g., by seeking information, finding alternative ways to accomplish daily tasks, etc.) reduce their anxiety along with their pain and adapt well to their injury. At the other extreme, people may respond to their anxiety by avoiding all activities they believe may cause pain. What they avoid can include not only activities that will cause pain, but also those that they wrongfully believe will cause pain (based on reading, warnings by doctors, memories from prior stages of recovery, etc.). The avoidance deprives patients of opportunities to overcome their anxieties about pain. In addition, the avoidance

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behavior is rewarded in the short term by momentary anxiety reduction. Eventually, chronic pain beliefs and heightened disability develop (7).

Although the research on pain-related anxiety in upper extremity patients is limited, there is a growing literature for back and other musculoskeletal pain. Several studies have found that anxiety about pain is a better predictor of disability than pain itself. Anxiety about pain correlates with disability as measured by physical performance tasks such as weight lifting and range of motion, as well as self-reported disability. Patients with high anxiety about pain are more likely to over-predict how painful an activity will be. There is also evidence that pain anxiety is a precursor, not a consequence, of disability (7).

ATTENTION TO PHYSICAL SENSATIONS

Everyone experiences discomforts such as headaches and joint pain, but people differ in how much they pay attention to these sensations. Attention to physical sensations (also called private body consciousness, somatic focus, and somatic awareness) may be important to how much people notice and therefore report symptoms. There is evidence that the relationship between somatic focus and symptom reports is especially important in people who are anxious. For example, people who are anxious and have more somatic focus report more locations of pain and report these sensations as more noxious (8, 9).

MOTIVATION TO RECOVER

It is well recognized that Workers' Compensation claims, active lawsuits, and other forms of secondary gain interfere with recovery. Less commonly considered are the subtle, often unconscious incentives patients can have for remaining disabled.

In some cases patients may have little motivation to recover because recovery requires resuming unwanted activities and responsibilities. One important factor for employed patients is job satisfaction. In the back pain literature, low job satisfaction at the initial onset of pain has been linked with the pain turning into a chronic problem (10). In addition, job satisfaction, perceived adequacy of income, and social class predict how likely someone is to report low back pain or consult a doctor about a new episode of low back pain (11, 12). The onset of forearm pain is also predicted by job satisfaction (13).

Burnout is important to the report of pain and disability (14). One definition of burnout is the experience of physical, emotional, and mental exhaustion as a result of working with people in situations that are emotionally demanding (15). This exhaustion may interfere with the recovery process, and may also be a disincentive to recover because the patient would like to avoid returning to the situation causing the burnout.

LOCUS OF CONTROL

People differ in their beliefs about who controls their pain and recovery. It has been suggested that health locus of control can be divided into three dimensions: internal, powerful others, and chance (16). Internal locus of control is the degree to which people believe they control their health by their own

behavior. The degree to which people believe others—such as doctors or medicines—control their health is locus of control with powerful others. Finally, people may believe that luck controls their health.

High internal locus of control has been associated with positive adaptation to chronic pain problems. It has been theorized that high internal locus of control is adaptive because the beliefs lead people to actively pursue health-promoting behavior and use better coping strategies. In contrast, when locus of control centers on powerful others and chance, patients feel helpless and use poorer coping strategies. Patients that believe outside influences have a stronger influence than their own efforts are less likely to adhere to physical training programs or employ preventive behavior (16).

COPING STRATEGIES

Coping strategies are important in adaptation to pain and illness. Coping strategies can be defined as specific cognitive and behavioral efforts undertaken by the individual in an attempt to restore equilibrium and resolve problems (16). Catastrophizing (employing excessive and exaggerated negative self-statements) is one strategy associated with poor adaptation to chronic pain. More generally, active coping strategies (exercise, ignoring pain, finding distractions) are associated with better physical and psychological functioning, while passive coping strategies (withdrawal, resting, taking medication, wishful thinking) are associated with poorer functioning (17, 18).

OPTIMISM AND EXPECTATIONS

Optimism has a beneficial impact on health and recovery after surgery (19). Optimism is the tendency to hold positive expectations about the future. People's level of optimism is stable over time and associated with psychological wellbeing (16). Pre-operative optimism has predicted better post-operative health status in patients undergoing hip and knee replacement, orthognathic surgery, and coronary artery bypass surgery. Among patients undergoing surgery for sciatica, patients' pre-operative expectations for shorter recovery time predicted better post-surgical satisfaction with surgery (20). Optimism is associated with positive adjustment in patients with rheumatoid arthritis.

While general dispositional optimism may predict better surgical outcomes and long-term adjustment, future studies should determine whether unrealistically high expectations may have the opposite effect. For example, patients who are disappointed by elective surgery's results based on unrealistic expectations, or who take a less active role in their recovery because they expect a miraculous cure, may have poorer outcomes.

NEUROTICISM

Neuroticism is a personality trait that has been linked with self-reported physical symptoms. Neuroticism, also sometimes called trait negative affect, is the stable tendency toward negative mood, negative self-concept, distress and dissatisfaction (21). The trait has been correlated with reporting several common symptoms (stomach aches, joint pain, etc.) and

reporting symptoms with no physiological basis in people with colds (22). These findings suggest that neuroticism should be researched in hand populations as one explanation for why physician-based and patient-based assessments often differ. These past studies also highlight the importance of personality to subjective outcome ratings, and thus the need to use caution in interpreting outcome instruments such as the SF-36.

PSYCHIATRIC DIAGNOSES THAT PRESENT AS HAND DISORDERS

Somatic symptoms are common among patients with psychiatric diagnoses. For example, poor mental health is one of the best predictors of frequent attendance in primary care (23). Not only do patients with psychiatric problems tend to have somatic complaints; there are psychiatric disorders whose key features are physical symptoms.

In factitious disorder, a patient consciously feigns or self-induces illness in order to assume the sick role. In the upper extremities, the most commonly cited symptoms are factitious arm swelling, ulcers, wounds, and joint swelling (24). The illness serves a psychological need of the patient, such as assuming the sick role to adapt to a frustrating life experience. In contrast, the malingering patient fabricates or exaggerates illness for gain distinct from the goal of being a patient, such as monetary compensation or narcotics.

Somatiform disorders are another set of psychiatric disorders that involve physical symptoms. In contrast to factitious disorder and malingering, the symptoms are not produced consciously and are not under voluntary control. The symptoms cause significant distress or impairment in social, occupational, or other areas of functioning. Somatization disorder is characterized by multiple symptoms of pain, in addition to gastrointestinal distress, sexual dysfunction, and pseudoneurological problems. Either the symptoms are unrelated to a medical condition, or they are in excess of what a related medical condition explains. In conversion disorder, patients produce symptoms or deficits affecting motor or sensory function and are unaware that they are doing so. A classic example is clenched hand syndrome. Hypochondriasis involves misinterpretation of symptoms and preoccupation with fears about health. The fear does not resolve with medical reassurance and lasts at least 6 months. In body dysmorphic disorder, patients experience markedly excessive preoccupation with an imagined or slight defect in appearance, such as a scar or deformity.

PSYCHOLOGICAL FACTORS IN CLINICAL PRACTICE

When analyzing the role of psychological factors in musculoskeletal illness, we have found it useful to consider three common clinical scenarios: 1) patients recovering from a traumatic injury, 2) patients presenting with vague complaints, and 3) patients undergoing elective surgery.

RECOVERY AFTER INJURY

To illustrate the potential role of psychological factors in recovery from injury it is useful to consider contrasting examples. It is commonly noted that self-employed patients recover more quickly and completely from injury. While self-employed patients are susceptible to PTSD and depression,

they may be more likely to have a constructive response to pain (low pain anxiety), to be motivated to recover (high job satisfaction, low burnout), to take personal responsibility for their recovery (high internal locus of control), to have good coping strategies, and to be both optimistic and realistic. In contrast, an injured employee may have disincentives to recover (secondary gain, job dissatisfaction, burnout) and may believe that caregivers and luck have a greater influence over their recovery than their own attitudes and efforts (high external locus of control).

PATIENTS WITH VAGUE COMPLAINTS

Diagnosis determines treatment and prognosis. It also has important implications regarding reimbursement, compensation, and medicolegal issues. Many patients present with complaints of pain or numbness in a diffuse, non-anatomic distribution to which no diagnosis can be confidently applied. Labeling such patients with a diagnosis, particularly a highly charged one such as carpal tunnel syndrome, repetitive stress injury or fibromyalgia, can be harmful to the medical care and recovery of such patients as well as to their functioning in society. It is more accurate and useful to diagnose such patients with idiopathic pain or numbness, reserving more specific diagnoses until serial examination or strong data from diagnostic interventions provide adequate support.

In trying to understand patients that present with vague complaints, psychological factors become very important. Contrast, for example, the patient that presents late with a problem that they have accepted and adapted to until it reached an advanced stage that could no longer be ignored, with the patient that presents at the onset of every musculoskeletal complaint. Musculoskeletal symptoms are pervasive, and most people who focus for a moment on their muscles will find one that aches a little. Patients with substantial pain anxiety and somatic attention may be more bothered by minor musculoskeletal aches and pains. Avoidance behaviors may exacerbate symptoms and disability. Neuroticism, job dissatisfaction, burnout, and poor coping strategies may allow relatively small problems to have a larger impact.

Locus of control may be one of the most important factors in determining when and why patients seek medical attention. Rather than take responsibility for their musculoskeletal illness, patients with a high external locus of control believe their physician controls their recovery. It is not uncommon for a patient to be upset with a physician who cannot confidently diagnose and treat their complaints because they believe that the physician is not fulfilling his or her responsibility to provide them with relief. The inaccurate perception of physicians as miraculous healers—reinforced by sensationalistic journalism—compounds the problem. In contrast, a patient with a high internal locus of control may view the physician as a useful ally in their attempts to deal with their problem, and may be more accepting of the limits of modern medicine.

Patients with vague complaints may utilize a relatively high proportion of medical resources. For example, one study found that patients with somatization disorder had medical

costs nine times greater than the average medical patient (25). Physicians often feel obliged to order numerous diagnostic tests in order to be certain nothing is missed. The motivation for this is often more from medicolegal concerns than proper treatment of the patient. In fact, too many diagnostic tests can hinder care because it can be difficult to interpret tests such as MRI's in the presence of an inconsistent and confusing history and examination. MRI in particular has been shown to be very sensitive for asymptomatic anatomic abnormalities of the spine and shoulder. Once a reasonable number of interventions and opinions have been obtained, most patients would accept the small possibility that something important has been overlooked.

RESULTS OF ELECTIVE SURGICAL INTERVENTIONS

When patients choose surgical treatment for their symptoms, success may depend upon meeting the patient's expectations. While surgeons often judge failure based upon technical criteria or adverse sequelae, a technically successful and complication-free intervention may be judged a failure by a patient whose expectations have not been met.

Success of elective operative procedures is also contingent upon accurate diagnosis and appropriate indications. Given that the relationship between objective findings (such as radiographic changes) and symptoms (such as pain) is not straightforward, it can be challenging to identify patients that will be improved by surgery, particularly in the context of the myriad psychological influences on illness. Pain anxiety, neuroticism, pessimism, poor coping strategies, and disincen-

tives for recovery may all lead patients to report their symptoms as more severe. This may inappropriately affect how likely surgeons are to recommend operative intervention. Additionally, psychological factors are just as likely to affect symptom reporting after surgery as before, so they also influence the perceived success of the procedure. Operations intended for symptom relief, such as carpometacarpal arthroplasty for basal joint arthritis of the thumb, may be doomed to failure in this setting. Patients with these less adaptive psychological influences may also have a less optimal objective functional result if they do not participate as vigorously in the post-operative rehabilitation program.

Locus of control is also important. The surgeon must be certain that the patient is not choosing operative treatment simply because he or she sees the surgeon as having control of their illness and that there are no other options.

CONCLUSIONS

The explosion in interest in patient-oriented outcomes and health-related quality of life is evidence that health care providers recognize that success cannot be measured simply by an improved radiograph or range of motion. Now that we are developing methods to measure the differences between the physician and patient points of view, we need to try to understand them and explain them. We believe that psychological factors are both a major influence on the patient's assessment of their health care as well as one of the most important determinants of the objective functional results of treatment.

Table 1. Commonly Used Valid Assessment Instruments

Psychological Factor	Instrument
Posttraumatic Stress Disorder	Clinician Administered PTSD Scale; Diagnostic Interview Schedule; PTSD Check List.
Anxiety about Pain	Pain Anxiety Symptom Scale; Pain And Impairment Relationship Scale; Survey Of Pain Attitudes; Fear Avoidance Beliefs Questionnaire.
Somatic Focus	Private Body Consciousness scale of the Body Consciousness Questionnaire.
Job Satisfaction	Job Descriptive Index.
Burnout	Melamed's Burnout Inventory; Maslach Burnout Inventory.
Coping Strategies	Coping with Health Injuries and Problems Scale; Coping Strategies Questionnaire; Vanderbilt Multidimensional Pain Coping Inventory; Pain Catastrophizing Scale.
Optimism	Life Orientation Test; Generalized Expectancy for Success Scale; Attributional Style Questionnaire.
Locus of Control	Multidimensional Health Locus of Control Scale; Pain Locus of Control Scale.
Neuroticism	NEO Personality Inventory; Eysenck Personality Inventory.

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