

REVIEWS

Functional Abdominal Pain Syndrome

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Functional abdominal pain syndrome (FAPS) is one of the less common functional gastrointestinal disorders, yet it is one with high health care impact. It is best understood from a biopsychosocial perspective as the interaction of biologic and psychosocial factors contributing to symptom experience and behavior. The pain of FAPS relates primarily to dysfunction of central pain modulatory systems; however, disturbances in motility or visceral hypersensitivity may contribute. There are characteristic clinical and behavioral features that typify patients with FAPS, and the medical evaluation must include their recognition through psychosocial assessment, physical examination, and a conservative, cost-effective effort to exclude other diseases. The treatment approach depends on establishing an effective physician-patient relationship, setting reasonable treatment goals, and using multicomponent medical and behavioral strategies that are individualized to patient needs. In refractory cases, referral to a multidisciplinary pain treatment center might be helpful.

Functional abdominal pain syndrome (FAPS), previously identified as chronic functional abdominal pain, is a challenging medical disorder that requires a special understanding and approach to treatment. The condition has no characteristic laboratory or morphologic features, its pathophysiology is only beginning to be understood, and psychosocial factors play an important role in the clinical presentation and treatment approach. For these reasons, FAPS might bewilder and at times frustrate those gastroenterologists who appraise it from a disease-based, biomedical perspective when a biopsychosocial approach is more appropriate.¹ To address these issues, this will discuss clinical, neurophysiologic, and psychosocial concepts of FAPS necessary to evaluate and treat patients with this disorder.

Definition and Classification

According to the Rome II classification system of functional gastrointestinal disorders,² FAPS is classified within the group of the functional bowel disorders.³

Characterized as chronic recurrent or continuous abdominal pain, attributed to the gut, but poorly related to gut function, FAPS is better understood as an abnormal perception of normal (regulatory) gut function, instead of a true motility disorder. Therefore, patients with FAPS will not typically experience relief of pain after defecation (a pattern that is characteristic for irritable bowel syndrome [IBS]), supporting the contention that disturbances in bowel motility do not fully explain the pain. More recent studies, to be discussed, are characterizing the pain in terms of alterations in CNS pain regulatory mechanisms in response to visceral afferent signaling. This finding of dysfunction of central interpretation of afferent signals might help us understand the reporting by patients with FAPS of other unpleasant somatic symptoms like those seen in fibromyalgia or chronic fatigue syndrome. Furthermore, when the pain of FAPS becomes severe and disabling, dominating the patient's life, the syndrome is usually associated with chronic pain behaviors and comorbid psychological disturbances.⁴ In general, patients with FAPS have more severe symptoms and greater functional impairment than patients with irritable bowel syndrome and are less likely to respond to peripherally gut-acting treatments specifically used for IBS. The Rome II diagnostic criteria for FAPS³ include at least 6 months of: (1) continuous or nearly continuous abdominal pain, (2) no or only occasional relationship of pain with physiologic events (e.g., eating, defecation, menses), (3) some loss of daily functioning, (4) the pain is not feigned (e.g., malingering), and (5) insufficient criteria for other functional gastrointestinal disorders that would explain the abdominal pain.

When the patient has functional abdominal pain that fails to reach the above criteria, the diagnosis is unspec-

Abbreviations used in this paper: ACC, anterior cingulate cortex; DRN, dorsal reticular nucleus; FAPS, functional abdominal pain syndrome; IBS, irritable bowel syndrome.

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1542-3565/04/\$30.00

PII: 10.1053/S1542-3565(04)00118-1

ified functional abdominal pain. However, in both cases, the criteria also assume adequate evaluation to exclude other structural disorders that might produce chronic abdominal pain.

The Physician's Experience With FAPS

Understanding and effectively caring for patients with FAPS require some personal reflection regarding attitudes and beliefs. Consider how physicians might respond to seeing a patient with a 10-year history of difficult to manage chronic abdominal pain. The patient might urgently describe the pain as "tormenting . . . the worst ever" and might state an expectation that the physician will help where others have failed. After extensive diagnostic evaluations, it becomes clear that no further studies are needed, yet the patient might remain concerned that something has been missed. Often, there are many other pain episodes and operations beginning early in life, and there might be several stressors including major losses and emotional, physical, or sexual abuse. The patient might appear depressed or angry, yet might deny the contributing role of stress: "Everything would be fine if you just take away the pain." While stating intentions of doing anything to achieve pain relief, the patient might seem unable or unwilling to engage in a participatory therapeutic relationship or to attempt self-management and looks to the doctor to provide answers. Previous medical and behavioral treatments have been unsuccessful or rejected because they did not work or had side effects. Finally, the patient's unsuccessful efforts toward adhering to treatments might even lead the physician to believe that the patient's health care is more of a competition than collaboration. This clinical presentation might raise several physician-related concerns.⁵ For example, has a diagnosis been missed? The chronic abdominal pain from an advanced neoplasm, IBD, or other structural disorder is frequently accompanied by weight loss, anemia, fever, abnormal laboratory study results, or morphologic findings on endoscopy or x-ray. However, follow-up studies of patients diagnosed with FAPS during a period of several years yield structural or biochemical evidence for other medical diagnoses in less than 10%.^{4,6} Thus, whereas other diagnoses must be considered, they are far less common when the pain is longstanding (usually more than 2 years),⁷ and prior studies are unrevealing. Therefore, although the physician should maintain vigilance for other medical conditions explaining the pain, further diagnostic testing should not be entertained unless new findings emerge in future visits. This "wait and see" approach minimizes unneces-

sary and expensive studies.^{8,9} Another concern is a possible underlying psychiatric disorder explaining the symptoms. Although psychiatric diagnoses might coexist, psychological test results among patients with FAPS usually show no single, specifically treatable psychiatric disorder, and the psychological profiles of patients with FAPS might be similar to patients with chronic pain from pancreatic disease, cancer, or other structural disorders.^{10,11} Furthermore, patients with FAPS typically define their illness as medical⁸ and are reluctant to receive psychological assessment or treatment.⁹ For these reasons, psychological disturbances, if present, must be considered as comorbid features of a brain-gut disorder, rather than as a primary psychiatric diagnosis.

Physicians also might question whether they can provide the time or have the skills to care for patients with FAPS. They might have concern about the chronic and at times refractory nature of the disorder, yet they might find that the patient's attention is directed more toward making a diagnosis and complete symptom relief than toward coping and management of an established functional gastrointestinal disorder.⁵ At times, physicians might even believe that the patient does not want to be helped.

Although these concerns are understandable, they warrant reconsideration. Gastroenterology practice frequently involves caring for patients with chronic diseases, and the prognosis for patients with functional gastrointestinal disorders is better than for those with structural diagnoses. Furthermore, chronic pain disorders lead to psychosocial concomitants including hopelessness, desperation, vulnerability, and personal feelings of lack of control and ineffectiveness. Understandably, patients might develop pessimistic attitudes and maladaptive "catastrophizing" behaviors that physicians might perceive as oppositional or noncompliant. However, physicians can develop the skills to modify these attitudes and behaviors within the context of an effective physician-patient collaboration.^{5,12,13}

Finally, the above factors might prevent some physicians from feeling gratified in the interaction.⁵ Often this relates to setting unrealistic expectations to make another diagnosis or to cure, or interpreting the patient's distress as personal criticism. However, gratification also comes from recognizing FAPS as a bona fide disorder, achieving an understanding of the patient, accepting and supporting their discomfort and distress, working together on the problems, and setting a realistic course of care. Hearing a patient state, "The pain is still there, but I am managing it better," can be a gratifying outcome. Conceptually, this approach requires that FAPS be un-

FAPS - Conceptual Model

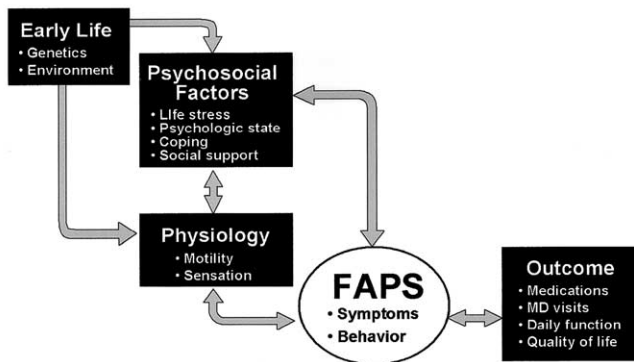


Figure 1. A biopsychosocial understanding of FAPS. Consistent with a systems or biopsychosocial model of illness, FAPS is predisposed by early life (genetic, environmental) factors, and the patient's symptoms and behaviors result from the interaction between psychosocial factors and gut physiology (motility and sensation), thereby leading to symptoms and adverse health outcomes.

derstood neither as a medical nor a psychiatric disease, but as a biopsychosocial disorder that has associated impairments affecting the individual's emotional well-being, quality of life, and health behaviors.¹ As shown in Figure 1, FAPS is a derivative of psychological and gut physiologic input, interacting via the brain (CNS)-gut (enteric nervous system) axis. This integrated understanding of FAPS places it into a more comprehensible form, leading to an effective plan of care.

Epidemiology and Health Care Impact

In the U.S. Householder study¹⁴ of the functional gastrointestinal disorders, FAPS was seen in 2% of the sample (primarily women), considerably less than IBS (9%). Patients with FAPS missed 11.8 workdays from illness compared to 4.2 days for those without bowel symptoms, and they had 7.2 physician visits compared to 1.9. A large proportion of patients with refractory symptoms are selectively referred to gastroenterology practices and medical centers, and they then have a disproportionate number of health care visits and undergo numerous diagnostic procedures and treatments. One study in the United Kingdom evaluated 20 patients with FAPS.⁸ All were women, and during a 7-year period, these patients saw 5.7 consultants, underwent 6.4 endoscopic or radiologic procedures, and had 2.7 major operations, primarily hysterectomy and laparotomy, with only temporary benefit. More than 85% received a psychiatric referral, but most preferred to see medical physicians, and 40% had tried alternative medical treatments. These findings emphasize the need to reduce unneeded studies and to

focus on management ("Don't just do something, stand there!").¹⁵

Pathophysiology

Recent studies are providing data to help understand and, in the process, legitimize FAPS, and offer opportunities for future treatments. Following is a conceptual framework of the neurophysiologic features of FAPS based on a growing understanding of the disorder that relates to dysfunction of brain-gut pain regulation.

Chronic pain is a multidimensional (sensory, emotional, cognitive) experience, best explained by abnormalities in the neurophysiologic functioning at the afferent, spinal, and CNS level.¹⁶ Chronic pain is distinct from acute pain arising from peripheral/visceral injury or disease, because structural abnormalities, motility disturbances, and tissue damage leading to increased afferent visceral stimuli are not prominent and might not even be present. With FAPS, the CNS as the primary modulator of the pain amplifies incoming regulatory visceral afferent signals to a point of conscious awareness and distress.

Ascending Visceral Pain Transmission

Figure 2 depicts the principal afferent pathways that originate from the colon, here in response to balloon distention, project to the spinal cord, and then ascend to the thalamus and midbrain. They include the spinothalamic, spinoreticular, and spinomesencephalic tracts.^{17,18} The spinothalamic tract terminates in the medial thalamus containing the parafascicular nucleus and also terminates in the posterior thalamus containing VPL/VPM nuclei. Thalamocortical fibers then project to the primary somatosensory cortex. The spinothalamic pathway

IBS - Ascending Visceral Pain Pathway

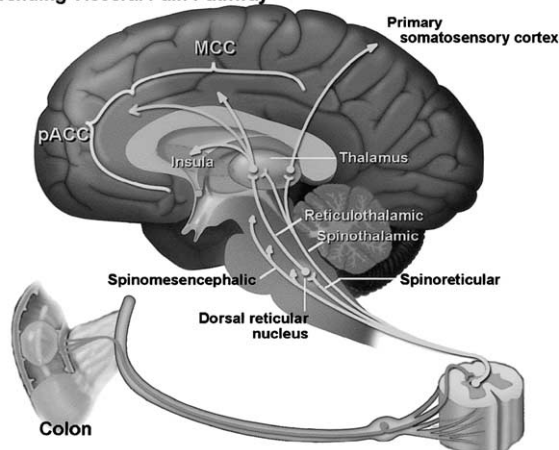


Figure 2. Neuroanatomic pathways mediating visceral pain sensation.

is important for sensory discrimination and localization of visceral and somatic stimuli. The spinoreticular tract (middle pathway) conducts sensory information from the spinal cord to the reticular formation in the brainstem. The reticular formation has almost no information about where on the body surface noxious stimulation occurs and is involved mainly in the reflexive, affective, and motivational properties of such stimulation. The reticulothalamic tract projects from the dorsal and caudal medullary reticular formation (dorsal reticular nucleus [DRN]) to the medial thalamus. The spinomesencephalic tract ascends the spinal cord with fibers to various regions in the brainstem including the periaqueductal gray, locus caeruleus, and DRN in the medulla. Thalamocortical projections from the medial thalamus transmit sensory input to different areas of the brain, such as the cingulate cortex and insula that are involved with the processing of noxious visceral and somatic information. The brain regions innervated by these pathways that are activated in response to painful colorectal stimuli include the thalamus, anterior insula, amygdala, and anterior cingulate cortex (ACC). The latter region is comprised of 2 components, perigenual ACC and midcingulate cortex, with the former involved in affect and the latter in behavioral response modification. Other pathways for transmission of noxious visceral stimuli (such as the dorsal column pathway) exist but are not shown. This multicomponent integration of nociceptive information, dispersed to the somatotypic and intensity area (to the lateral sensory cortex as well as the emotional or motivational-affective area of the medial cortex), explains the variability in the experience and reporting of pain.¹⁹

This conceptual scheme of pain modulation through both sensory and motivational-affective components has been supported through positron emission tomography imaging by using O¹⁵radiolabeled imaging.²⁰ Among healthy subjects who immersed their hands in hot (47°C) water, half were hypnotized to experience the immersion as painful and the other half as not painful or pleasant. Comparison of changes in cortical activation between these 2 groups found no difference in activity in the somatosensory cortex. However, for those subjects hypnotized to experience the hand immersion as painful, there was significantly greater activation of the ACC of the limbic system. Thus, the hypnotic suggestion differentiated the functioning of these 2 pain systems; the suggestion of unpleasantness specifically encoded the anterior midcingulate portion of the ACC, an area involved with negative perceptions of fear and unpleasantness.

Peripheral Amplification of Visceral Afferent Signals

Although abnormalities in central regulation of afferent signals are considered a primary feature of FAPS, the disorder might receive amplified signals from visceral inflammation and injury as occurs with IBS and other painful functional gastrointestinal disorders.²¹ Possibly, either an increase in peripheral receptor sensitivity or an increase in the excitability of spinal or higher CNS pain regulatory systems might be responsible for producing a state of hyperalgesia (increased pain response to a noxious signal), allodynia (increased pain response to non-noxious or regulatory signals), and/or chronic pain.^{22,23}

Clinical experience attests that patients with chronic abdominal pain might have prior episodes of frequent or recurrent pain events or painful procedures that later become more generalized to a chronic and persistent symptom presentation. Patients with chronic abdominal (e.g., IBS) pain undergo more abdominal and gynecologic operations than control groups.^{24,25} Although the surgeries have been attributed to increased health care seeking and illness behaviors, an alternative explanation is that the surgical insult triggered the painful functional gastrointestinal disorder and manifested clinically in patients with psychological predisposition. One prospective study reported that symptoms suggestive of IBS arise de novo in about 10% of women undergoing hysterectomy.²⁶ Furthermore, preoperative treatment with local or regional anesthesia or NSAIDs reduces the severity of postoperative pain,²² suggesting that the CNS response to peripheral injury can be modified by prior reduction of afferent input to the spinal cord and CNS. Finally, surgery causes postoperative pain that is inflammatory in nature and is associated with reduced stimulus threshold and pain enhancement. The factors predicting the pain response depend on the site and duration of the surgery and the individual's psychological vulnerability to pain.²⁷ Therefore, recurrent peripheral injury, such as repeated abdominal operations in the psychologically predisposed host, might sensitize intestinal receptors, making perception of even baseline (regulatory) afferent activity more painful.

These findings harmonize with data relating to the development of visceral hypersensitivity and postinfectious IBS. Inducing inflammation and injury to nerve fibers in animals can alter the function and structure of peripheral neural systems in neonates,²⁸ and when applied to the gut mucosa, it will yield a greater pain response to visceral distention when they become adults.²⁹ In humans, repetitive balloon inflations in the colon lead to a progressive, although transient, increase

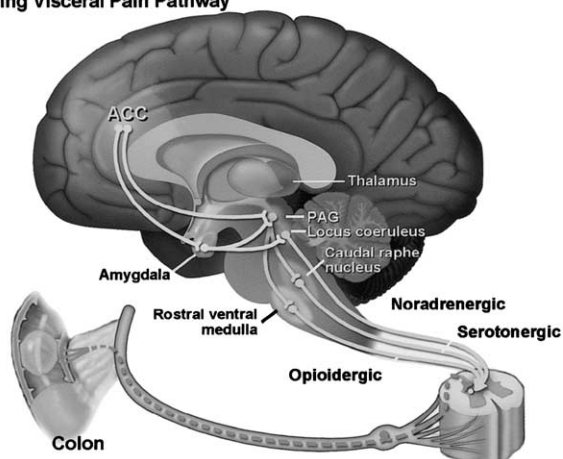
Descending Visceral Pain Pathway

Figure 3. Descending inhibitory pathway for visceral pain.

in pain intensity,³⁰ occurring to a greater degree and for a longer period in patients with functional gastrointestinal disorders.³¹ Postinfectious IBS might be due to the combination of an inflammation-induced altered mucosal immune system (involving increased cytokine and serotonin-producing enterochromaffin cells) sensitizing visceral afferent nerves³² and some degree of central emotional distress. The latter further amplifies the afferent signal to a point of conscious awareness.^{21,33} In one prospective study, 94 patients hospitalized with acute gastroenteritis and no history of bowel complaints were followed up 3 months later.³⁴ Although most ($n = 72$) of the patients recovered clinically, 22 continued with abdominal pain and bowel dysfunction. Notably, both groups had similar levels of gut hypermotility and visceral sensitivity. Greater psychological distress characterized the group with continued pain at the time of the infectious episode and a greater number of mucosal inflammatory cells during the 3-month follow-up period. It was proposed³³ that the similar levels of abnormal motility and visceral hypersensitivity relative to the controls were permissive factors. However, the CNS amplification of these peripheral signals, occurring in the psychologically distressed group, raised these signals to a level of conscious awareness and perpetuated the symptoms. The increased pain might have also been mediated via CNS influences on peripheral inflammatory/cytokine activity.

Descending Modulation of Pain

The gate control theory explains the descending modulation of painful stimuli.¹⁹ Figure 3 shows the principal components of the descending pain modulatory system activated in response to the noxious balloon distention of the colon. It is believed that the central

descending inhibitory system originates in the ACC, which is rich in opioids,³⁵ and possibly also from other cortical regions. Because the ACC has connections to descending corticofugal inhibitory pathways and is a site of high opioid activity, it is postulated that activation of this region from peripheral/visceral afferent activity might in part serve to down-regulate these signals. Descending connections from the ACC and the amygdala to pontomedullary networks, including the periaqueductal gray, rostral ventral medulla, and the raphe nuclei, activate inhibitory pathways via opioidergic, serotonergic, and noradrenergic systems^{17,36} to the dorsal horn of the spinal cord, which acts like a “gate” to increase or decrease the projection of afferent impulses arising from peripheral nociceptive sites to the CNS.

Central Amplification and the Role of Psychological Distress

What is the role of the CNS in the development of FAPS? As noted, the evidence for the development of visceral sensitization suggests that psychological distress might serve as an amplifying factor. However, although peripheral sensitization might influence the onset and short-term continuation of the pain, the CNS is preeminently involved in the predisposition and perpetuation of pain leading to a chronic pain condition. This is evident by the lack of peripheral motor or sensory abnormalities and the strong association of psychosocial disturbances in this disorder. In addition, comorbid psychiatric diagnosis, major life stress, a history of sexual or physical abuse, poor social support, and maladaptive coping are associated with more severe and chronic abdominal pain and poorer health outcome.^{3,37–39}

The links between emotional distress and chronic pain might be mediated through impairment in the limbic system’s ability to modulate visceral signals. Recent studies suggest that the motivational-affective component of the limbic or medial pain system, specifically the ACC, is dysfunctional in IBS and other chronic painful conditions,⁴⁰ and these findings might have application in FAPS. In response to a painful stimulus, there is differential activation of the perigenual ACC, an area rich in opioids, associated with emotional encoding, and the posterior ACC, also called the rostral midcingulate cortex. This is an area associated with unpleasantness, fear (along with the amygdala), and motor pain behavior.⁴¹ When using positron emission tomography and functional magnetic resonance imaging to evaluate the ACC response to rectal distention or the anticipation of distention, IBS patients preferentially activate the midcingulate cortex and have less activation of the perigenual ACC relative to control subjects.^{42–45} Possibly in IBS,

activation of the descending inhibitory pain pathway that originates in the opioid-rich perigenual ACC is supplanted by activation of the midcingulate cortex, the area associated with fear and unpleasantness. Similar findings occur in patients with somatization⁴⁶ and post-traumatic stress disorder.⁴⁷ More recent evidence from our group suggests a synergistic effect of abuse history and IBS leading to greater ACC activation and pain reporting than either condition alone,^{48,49} supporting clinical evidence that patients with functional gastrointestinal disorders with abuse report more pain and have poorer health behaviors than those with IBS alone.³⁹ In addition, we found a strong correlation between life stress and maladaptive coping with ACC activation. Notably, antidepressant and psychological treatments are associated with a return of the dysfunctional ACC reactivity to a more normal state.^{50,51} This finding also occurs in patients with depression.^{52,53} These data suggest that emotional disturbances might aggravate the dysfunctional central pain regulatory pathways seen in functional gastrointestinal pain. Although further confirmatory data are needed specifically for FAPS, the findings are compelling and provide a mechanistic basis for psychological and antidepressant treatments.

Clinical Presentation

Consistent with the biopsychosocial model,^{1,54} FAPS is seen as a dysregulation of brain-gut function. Therefore, the clinician must identify the biologic and psychosocial influences on the pain experience and behavior to implement proper treatment. Several clinical and behavioral features typify patients with FAPS, particularly as seen in referral gastroenterology practices or medical centers.⁴

Description of the Pain

The pain might be described (1) in emotional terms, e.g., as “nauseating” or “like a knife stabbing,”⁷ reflecting a limbic contribution to the pain; (2) as constant and not influenced by eating or defecation, i.e., less related to disturbances in motility; (3) as involving a large anatomic area rather than a precise location; (4) as one of several other painful symptoms; and (5) as a continuum of painful experiences beginning in childhood or recurring over time.

Symptom Behaviors

Many of the clinical features of patients with FAPS are behavioral in nature. However, they are of limited diagnostic value, because they might also occur among patients with structural diseases and must be

understood within the context of a more comprehensive assessment. However, these features clarify how the patient appraises, responds to, and copes with the disorder. The following behaviors, while not occurring in all patients with FAPS, might be considered maladaptive. Many can be modified or reduced by the physician or mental health professional, encouraging more effective health-promoting behaviors.

The maladaptive behavioral features include (1) the verbal and nonverbal expression of pain that might diminish when the patient is engaged in distracting activities, but increase when discussing a psychologically distressing issue or during examination; (2) urgently reporting intense symptoms disproportionate to the available clinical and laboratory data (e.g., always rating the pain as 10 on a scale from 1 to 10); (3) minimizing or denying a role for psychosocial contributing factors or of evident anxiety or depression, or attributing them to the presence of the pain rather than to understandable life circumstances; (4) requesting diagnostic studies or even exploratory surgery to validate the condition as “organic”; (5) focusing attention primarily on complete relief of symptoms rather than adaptation to a chronic disorder; (6) frequently seeking health care; (7) taking limited personal responsibility for self-management, while placing high expectations on the physician to achieve symptom relief; and (8) making requests for narcotics when other treatment options have been implemented. This latter behavior rarely relates to sociopathic drug-seeking behavior. It might result from the belief that there are no other effective treatments, or that taking narcotics is a means to achieve a level of control over the condition.

Family Interaction

On occasion, a spouse or parent might assume responsibility for reporting the patient’s history, possibly interrupting the patient’s commentary, or prioritizing the discussion. This might lead the patient to engage in a competitive discussion or more passively to withdraw. Although the partner’s behavior might reflect a degree of concern and desire to be involved, it might also reflect family dysfunction (“enmeshment”) that can interfere with implementing an effective treatment strategy, unless the needs of all parties are considered and addressed. At the least it will be important for the physician to allow “equal time” to the patient. In such cases, part of the visit needs to be taken alone with the patient.

Presence of Other Medical Diagnoses

FAPS might coexist with other structural (e.g., chronic pancreatitis, IBD) or functional (e.g., IBS, func-

tional dyspepsia, functional biliary pain) medical conditions. The clinician must determine the degree to which CNS and peripheral nociceptive input contribute to the illness, and symptom (e.g., Rome) criteria might help identify the other functional gastrointestinal disorders.² Typically, when structural disease explains the pain experience, it is (1) more recent in onset (if undiagnosed); (2) described in more sensory (e.g., sharp, crampy, burning) rather than emotional terms; (3) more variable or intermittent in intensity; (4) more precise in locations conforming to neuroanatomic pathways; (5) more responsive to antimotility agents and/or peripherally acting (e.g., NSAIDs) analgesics; (6) related to events that affect gut function; and (7) usually associated with fewer difficulties in interpersonal relationships.⁵⁵

Patients might initially present with a different, painful gastrointestinal disorder, but over time, FAPS might become the primary condition when the pain pattern evolves as more continuous, severe, and nonresponsive to treatments. An example would be a patient with no pain history, undergoing 2 abdominal operations for defined reasons, and later presenting with frequent or constant pain, presumed to be adhesions, but in the absence of intestinal obstruction.

Concurrent Psychosocial Features

Although patients with FAPS show no consistent psychological profile, several psychosocial domains alone or in combination contribute to poor health outcome.

Psychiatric comorbidity. A large proportion of patients with FAPS exhibit Diagnostic and Statistical Manual-IV criteria for comorbid psychiatric diagnoses, including anxiety, depressive, and somatization disorders.^{3,37} Unlike patients with these primary diagnoses, patients with FAPS are frequently reluctant to acknowledge or accept their contributing role. This might result from learning experiences during childhood in which emotional expression is suppressed, whereas family attention is given preferentially when the child becomes ill.⁵⁶⁻⁵⁸ Later in life, the patient is either not aware of these mood alterations (e.g., alexithymia)⁵⁹ or perceives them as secondary to the pain.

Unresolved losses and abuse history. A history of unresolved losses, including the death of a parent or spouse, surgery (e.g., hysterectomy, abortion, or still-birth), are common features.^{7,60} Symptom exacerbations frequently develop or recur soon after these events, on their anniversary, during the Thanksgiving-Christmas season, or when the physician goes on vacation.⁷ As previously noted, a history of sexual and physical abuse might be evident.⁶¹ However, its presence is not diagnostic of FAPS, but it helps define the severity of the

Table 1. Evaluation

Psychosocial assessment
1. What is the patient's life history of illness?
2. Why is the patient coming now?
3. Is there a history of traumatic life events?
4. What is the patient's understanding of the illness?
5. What is impact of the pain on quality of life?
6. Is there an associated psychiatric diagnosis?
7. What is the role of family or culture?
8. What are the patient's psychosocial resources?
Physical examination
1. No autonomic arousal
2. Surgical scars
3. Closed eyes sign
4. Stethoscope sign
5. Carnett's test
Exclusion of other disease

condition. Independent of diagnosis, a history of abuse predicts poor health outcomes,³⁹ refractoriness to medical care, increased diagnostic and therapeutic procedures, and more health care visits.⁶¹ Because patients do not usually volunteer an abuse history,⁶² physicians must consider this possibility when symptoms are severe and refractory and inquire about it in a gentle and supportive fashion.⁶¹

Poor social support and maladaptive coping. Patients with FAPS report poor social networks and exhibit maladaptive coping strategies. They commonly state that they are unable to decrease the intensity of their symptoms and might exhibit catastrophizing thoughts, i.e., experience their condition in a pessimistic and morbid fashion, without any sense of control over the consequences. These beliefs and cognitions are associated with greater pain scores, more psychological difficulties, poorer quality of life, and more health care visits.⁶³ In some cases, the illness might provide social support by maintaining attention from friends and family and relationships with physicians.

Evaluation

When the clinical presentation is consistent with FAPS, the next step would be a clinical evaluation including a psychosocial assessment, physical examination, and conservative efforts to exclude other medical conditions in a cost-effective manner (Table 1).

Psychosocial Assessment

By asking only a few questions, the physician can effectively appraise the psychosocial contributions to the disorder.⁹

What is the patient's life history of illness? A long (>2 years) history of painful complaints and frequent health care visits for poorly documented diagnoses

(e.g., adhesions, gastroenteritis) predict a poorer prognosis.⁷

Why is the patient coming now? It is more efficient to address the reasons for the current visit than to explore the original bases for the pain, which frequently are multiple and complex. Visits might occur because of (1) increased concern about having a serious disease; (2) environmental stressors; (3) worsening of functional status; (4) a "hidden agenda" (e.g., seeking narcotics, acquiring disability status, or legitimization of illness to family or coworkers); (5) exacerbation of psychiatric disturbance (comorbidity); or (6) any combination.

Is there a history of traumatic life events? Traumatic events can include childhood or adult emotional, sexual, or physical abuse, death or divorce within the family, or losses of personal impact including abortion, stillbirth, or hysterectomy. When present, the physician must appraise the patient's willingness to explore this issue further, because it might be contributing to the pain condition.⁶¹ Appropriate mental health resources must be available.

What is the patient's understanding of the illness? When the patient's illness beliefs are consistent with the physician's understanding, a mutual treatment plan is easily developed. However, when these beliefs or the patient's goals are unachievable (e.g., to find the cause and cure), effective treatment requires addressing and negotiating the differences.

What is impact of the pain on quality of life? Diagnostic and treatment decisions are determined primarily by the patient's functioning and quality of life rather than by the severity of pain reported.

Is there an associated psychiatric diagnosis? Treatable psychiatric disorders might be diagnosed through psychological referral or with standardized symptom criteria (e.g., Diagnostic and Statistical Manual-IV).

What is the role of family or culture? Usually, family interactions around the patient's illness produce emotional support, and the focus is toward recovery. With dysfunctional family interactions, stresses are poorly managed, and the illness might in fact be adaptive as a means to divert family distress.⁶⁴ This is apparent when the spouse or parent indulges the patient, assumes undue responsibility in the management, or becomes the patient's spokesperson. During clinic visits it helps to spend separate time with the patient and then later see the family together, at which time communication occurs primarily with the patient. At times, the physician might suggest counseling to help the family develop better coping strategies around the illness.

Cultural belief systems will also affect how the pain is reported, and how the patient responds to treatment. For example, with Asians, open recognition of psychological difficulties is stigmatized, but physical symptoms are socially sanctioned,⁶⁵ whereas with Italians or Jews, communication of emotion is more socially sanctioned.⁶⁶ Importantly, patients might not comply with treatments inconsistent with their cultural beliefs.

What are the patient's psychosocial resources? Availability of social networks such as family, church, recreational clubs, and community organizations and of effective (problem-based) coping strategies helps to buffer the adverse effects of stress and improve outcome.⁶⁷

Physical Examination

The physical examination might provide some helpful information.

No autonomic arousal. Patients with FAPS do not typically exhibit autonomic arousal manifest by tachycardia, increased blood pressure, or diaphoresis; this occurs more often with acute, peripheral sources for the pain.

Surgical scars. The presence of multiple surgical scars without clearly understood indications might suggest a history of prolonged and severe pain leading to unneeded surgical procedures.⁶⁸

Closed eyes sign.⁶⁹ When the abdomen is palpated, the patient with FAPS might wince with eyes closed. In comparison, patients with more acute abdominal pain episodes keep their eyes open in fearful anticipation of the examination.

Stethoscope sign. Often the use of the stethoscope might reduce the behavioral response to pain and afford a more accurate appraisal of visceral activity. Conversely, with an acute abdominal event, abdominal palpation or changes in bodily position will increase pain behaviors.

Carnett's test. Carnett's test can help to distinguish visceral from somatic pain.⁷⁰ After identifying the site of maximal abdominal pain, the patient is asked to tense the anterior abdominal musculature. This can easily be elicited by having the patient attempt to sit up while the physician applies pressure to the patient's forehead. A positive test result, i.e., increased pain with tensing of the abdominal musculature, would suggest an abdominal wall etiology (e.g., cutaneous nerve entrapment, hernia), whereas a negative test result would be consistent with a visceral contribution to the pain. Although patients with FAPS might be presumed to have a negative test result (i.e., no increase in pain with tensing of abdominal muscles), personal experience indicates that patients with FAPS actually report more pain

and thus have a positive result. Similar to the closed eyes and stethoscope signs, this might be due to CNS hyper-vigilance to the area perceived as painful. Therefore, a positive test result tends to exclude visceral pain, but it requires that the physician distinguish between abdominal wall pain and FAPS.

Exclusion of Other Disease

Although in FAPS physical findings and diagnostic studies are typically negative, occasionally an important diagnosis is missed or coexists with FAPS. Accordingly, the physician must exclude other etiologies in a cost-effective manner.⁹ The presence of positive symptom criteria for FAPS^{3,71} is the starting point that leads to a conservative assessment. Recently the concept of alarm signs or red flags, which have helped to validate the positive predictive value of the Rome criteria for IBS,⁷² can be applied to FAPS. Thus, if there are abnormalities on physical examination (e.g., abdominal mass, enlarged liver) or in screening laboratory studies (e.g., anemia, high sedimentation rate, low serum albumin), significant weight loss, or blood in the stool, another diagnosis should be strongly considered and pursued accordingly. However, if the patient has longstanding symptoms that fulfill Rome criteria for FAPS and no red flags are evident, the diagnosis is nearly certain, and the physician should reassure the patient of this diagnosis and initiate symptomatic treatment with plans to reassess in 3–6 weeks.²¹ It is also common to find nonspecific abnormalities (e.g., cyst in the liver, palpable lymph node, “nonspecific” bowel gas pattern), and their presence requires some effort to determine their relevance to the symptom presentation.

Treatment Approach

The basis for treatment relies first on establishing an effective physician-patient relationship and then providing a more specific plan that relies on several treatment options^{12,73,74} (Table 2).

Establishing an Effective Patient-Physician Relationship

Several factors contribute to an effective relationship.^{12,74}

Empathy involves acknowledging the reality and distress associated with the pain through an understanding of the patient's experience while maintaining an objective and observant stance.⁷⁵ Empathy improves patient satisfaction and adherence to treatment, reduces adversarial patient behaviors, and can improve clinical outcome.⁷⁶ Despite the potential for early dissatisfaction by

Table 2. Treatment Approach

Establishing an effective patient-physician relationship
1. Empathy
2. Education
3. Validation
4. Reassurance
5. Negotiate the treatment
6. Set reasonable limits
The treatment plan
1. Set reasonable treatment goals
2. Help the patient take responsibility
3. Base treatment on symptom severity and the degree of disability
4. Medications
5. Mental health referral
6. Specific psychological treatments
7. Multidisciplinary pain treatment center referral

patients wanting a diagnosis and effective help quickly, the physician should not overreact by overmedicating or performing unneeded diagnostic studies or treatments. Diagnostic decisions are based on objective data rather than the patient's insistence that something be done.⁶⁸

Education is provided by (1) eliciting the patient's understanding of the condition, (2) addressing any unrealistic concerns, (3) explaining the nature of the symptoms in a fashion consistent with the patient's belief system, and (4) ensuring the patient's understanding of what was discussed. It helps to explain that chronic abdominal pain is a true disorder relating to abnormal sensation and/or dysregulation of neuroenteric function, and that it can be modified effectively by psychopharmacologic or psychological treatments that reestablish control of the pain.

Validation occurs through acknowledgment of the patient's feelings and beliefs. Examples include the following: “I can understand how difficult it has been for you” or “This has really affected your life.” These statements create a “bridge” to the patient, who receives them as coming from a person who understands and cares. Physicians must avoid unwittingly making personal judgments or closing the communication through quick reassurances or solution. Ineffective statements such as “Don't worry, it's nothing serious” or “Your problem is due to stress” are frequently perceived by patients as dismissive or judgmental, and they are to be avoided. Patients usually do see their condition as serious, and for various reasons, they might not consider it to be caused by stress.

All patients need reassurance, because many might fear serious disease or surgery. After the evaluation, the physician should respond to the patient's worries and concerns clearly and objectively, and then both must negotiate the treatment. The physician should ask about

the patient's personal experience, understanding, and interests in various treatments and then provide choices rather than directives. A patient will accept a recommendation if he or she understands the reasons behind it and believes it will help. Finally, the physician in a busy practice must set reasonable limits in time and effort, recognizing that for some patients, the care might need to be shared with a mental health professional. Scheduling brief, but regular appointments of fixed duration is the best response to patients' requests for more time. The key to success is maintaining an ongoing relationship, while maintaining proper boundaries.

The Treatment Plan

Set reasonable treatment goals. The longstanding nature of the pain of FAPS makes "cure" unlikely. Patients might hold such unrealistic expectations, and the physician will need to place the prognosis into proper perspective. With examples like arthritis or chronic back pain, the physician can explain that a realistic treatment goal would be some symptom relief with improved daily function. With younger patients, having frequent headaches or recurrent injuries can be given as examples in which the focus is more on recovery and rehabilitation rather than cure. This reframing of treatment goals is enhanced and supported by demonstrating the need for ongoing care through regular visits. I find it most effective to initially set up a visit, e.g., every 1–2 months, and when a trusting relationship is established (often after only 2 or 3 visits), then I taper the visits to every 3–6 months as needed.

Help the patient take responsibility. One way to increase the patient's responsibility for their illness is to ask them to keep a diary of symptoms⁹ for a few weeks, particularly identifying the circumstances of the pain episodes and their emotional and cognitive responses. This technique not only helps the patient to achieve insight into aggravating factors, but it also helps to characterize the patient's coping style. Such information might aid the mental health professional in choosing a behavioral treatment strategy.

Base treatment on symptom severity and the degree of disability. When the pain is not limiting, treatment is conservative. Patients who have intermittent pain episodes of moderate severity and can relate symptom exacerbations to psychological distress, often respond to psychological treatments.³⁷ However, if the pain is continuous and severe, psychoactive medications for central analgesia (e.g., tricyclic antidepressants) are indicated and might be useful.⁷⁷

Medications. Most analgesics (e.g., aspirin, NSAIDs) offer little benefit, because they act peripher-

ally. Narcotics should not be prescribed because of the potential for addiction and narcotic bowel syndrome, in which chronic use of narcotics leads to impaired motility and increased pain sensitivity.⁷⁸ Furthermore, their use subordinates the development of more comprehensive treatment strategies to that of providing medication. In many cases, withdrawal from narcotics along with a multicomponent pharmacologic and behavioral treatment plan,⁷⁹ possibly with the addition of clonidine^{80,81} to enhance withdrawal and improve gastrointestinal pain, can lead to an improved outcome. Benzodiazepines are of limited value because they can be abused and might lower pain threshold.⁸²

Antidepressants, particularly of the tricyclic type, can be helpful in treating chronic pain, FAPS, and other painful functional gastrointestinal disorders, on the basis of recent empiric evidence.^{77,83,84} However, patients might not tolerate the side effects or might feel stigmatized by taking a "psychiatric" drug, leading to poor adherence.^{77,85} In general, the tricyclic antidepressants, while being effective, produce more anticholinergic effects, hypotension, sedation, and cardiac arrhythmias and might require some dose adjustment to achieve an optimal effect. Thus, it is important for the physician to help the patient properly understand its clinical value and to work with the patient to assure adherence. Selective serotonin reuptake inhibitors (SSRIs) have also been used but do not have the same evidence for effect with chronic painful disorders. The SSRIs might cause agitation, sleep disturbance, vivid dreams, and diarrhea, but they are much safer if taken as an overdose. Although their efficacy for pain control is not well established, they have additional benefits because they are anxiolytic and are helpful for patients with other comorbid conditions including social phobia (or agoraphobia), post-traumatic stress disorder, panic, and obsessional thoughts related to their condition. In some cases when a single antidepressant is not helpful, augmentative therapy, as used in psychiatry, might be helpful. Examples include combining a low dose tricyclic antidepressant with an SSRI, adding buspirone to an antidepressant, or combining an antidepressant with psychological treatment.

The physician should explain that antidepressants are central analgesics, not simply drugs for psychiatric conditions, and they effectively treat other painful medical conditions like migraine, postherpetic neuralgia, and diabetic neuropathy. They increase the release of neurotransmitters that descend from brain centers to block pain transmission from the gut to the brain, and the dosage is usually lower than used for psychiatric disorders. For tricyclic antidepressants, doses can start low

(e.g., 25–50 mg of desipramine) and gradually increase up to 100–150 mg/day, depending on treatment response and tolerance to side effects. For SSRIs, dose ranging is usually not needed, and a single dose (e.g., 20 mg fluoxetine or citalopram) is often sufficient. The lag time for effect might take several weeks; most side effects diminish after a few days, and they can be reduced by temporarily lowering the dosage or occasionally by offering other medications to reduce symptoms.⁸⁶ For example, the anticholinergic effects of tertiary amine tricyclic antidepressants (e.g., amitriptyline, imipramine) occur less often when using a secondary amine tricyclic agent (e.g., desipramine, nortriptyline), by use of nontricyclic antidepressants, or the co-administration of a parasympathomimetic agent like bethanechol. Excess sedation can be reduced by lowering the dose of the tricyclic agent and adding a low dose SSRI. This serves to augment the anticipated clinical effect, while reducing toxicity. Similarly, temporarily adding a benzodiazepine agent or augmenting treatment effect with a low dose tricyclic antidepressant at bedtime can reduce “jitteriness” from an SSRI. The medication can be given for a few weeks, and then the patient can be reevaluated.

Mental health referral. Patients might be reluctant to see a psychologist or psychiatrist because they lack knowledge of the benefits of referral, feel stigmatized for possibly having a psychiatric problem, or see referral as a rejection by the medical physician. Psychological interventions are best presented as ways to help manage pain and to reduce the psychological distress of the symptoms. Medical visits should continue, with the psychological treatment either regularly or occasionally for reassessment, or as needed but with continuing availability.

Specific psychological treatments.³⁷ The mental health consultant might recommend any of several types of psychological treatments for pain management. Cognitive-behavioral treatment, which identifies maladaptive thoughts, perceptions, and behaviors, helps the patient develop new ways to increase control of symptoms. Recent data support the benefit of cognitive-behavioral treatment for patients with functional bowel disorders including FAPS.⁷⁷ Stress management is often added to cognitive or relaxation techniques as part of a multicomponent behavioral treatment program. Dynamic or interpersonal psychotherapy proposes that psychological distress and physical symptoms are exacerbated by difficulties in interpersonal relationships. As difficulties emerge during therapy, efforts are made to understand and address them, often improving the pain symptoms. Hypnotherapy has been investigated primarily in IBS, in

which the focus is on relaxation of the gut.⁸⁷ Relaxation training attempts to counteract the physiologic effects of stress or anxiety.

Multidisciplinary pain treatment centers. Multidisciplinary pain treatment centers provide comprehensive rehabilitation of patients with chronic pain. The approach is theoretically rational, and it might be the most efficient method of treating disability from refractory chronic pain symptoms.⁷⁰

Conclusion

The care of patients with FAPS involves an understanding of the mechanisms explaining the pain, i.e., dysfunction of central pain regulatory systems, an appreciation of the clinical and psychosocial features that characterize and amplify the symptoms and behaviors, the establishment of an effective physician-patient relationship, and the implementation of a variety of treatment options tailored to the needs of the patient. In most cases, the rationale for the treatments requires that the physician provide adequate information so the patient sees them as relevant to personal needs. This integrated biopsychosocial treatment approach is intuitively logical; however, future studies are required to determine long-term benefits and reduction in costs. Nevertheless, when this approach is properly implemented, the short-term outcome appears improved, and importantly, the process becomes mutually gratifying.⁵

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- The author thanks Ms. Christina Lomax for her assistance in the preparation of this manuscript.**