



Recognizing Recurrent Abdominal Pain In Children

By Mark Kovacs, MD

Although many children experience chronic recurring abdominal pain (RACP), true physical illness is rarely the cause. Once a positive diagnosis of RACP is made, physicians have a wide range of treatment modalities to choose from.

RECOGNIZING RECURRENT ABDOMINAL PAIN IN CHILDREN

Chronic recurrent abdominal pain is one of the most common reasons for a child's visit to the doctor. Only a minority of children will have a physical illness causing their distress, and of these, only a small number will have a serious long-term illness.

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Complaints of chronic recurring abdominal pain in children (RACP) are very common. However, it is very uncommon to have true physical illness cause these recurring abdominal pains. Only 5% to 10% of children with chronic recurrent abdominal pains, in fact, will have a true physical ailment. Identifying those

children most likely to have pain related to a physical ailment is important in diagnosing and treating the particular illness appropriately and promptly. Just as important, a quick and accurate diagnosis will avoid doing costly, invasive and potentially stressful investigations for the majority of children with nondisease-related pain. Whether the cause of the pain is physical or physiologic, the focus for both clinicians and parents should be on relieving the distress caused by abdominal pains.

A key step in relieving this distress is helping the child and family understand the possible physiologies of RAPC and explaining this is a well-defined, well-documented problem, which does not have the potential for any long-term physical harm. Once the positive diagnosis of RAPC is made, and the family has some understanding of the possible causes, the physician can quickly implement a great array of very effective treatment modalities.

The most exciting treatments, and perhaps most effective in long-term management, are the non-pharmacologic strategies. These range from simple relaxation therapy to hypno-analgesia or sensory modulation.

ETIOLOGY

One of the main concerns for parents is whether or not an undetected illness is causing their child's abdominal pain. Many clues that show up during history and examination can help direct the physician in deciding which children should be investigated immediately. The red flags that prompt clinicians to initiate further investigation are indicators of increased likelihood of true physical illness (Table 1). Remember, some of these symptoms occasionally do occur in healthy children with completely benign abdominal pain.

The consistency and recurrence of the red flag symptoms and signs is very important. The child who has been woken by pain once in six months is far less likely to have GI disease than the child who consistently wakes at night complaining of pain. Initiate appropriate investigation immediately when any wellfounded suspicion of true illness is present.

These red flag symptoms and signs usually relate to the more significant causes of abdominal pain, such as inflammatory bowel disease (IBD), ulcers, pancreatitis, HenochSchonlein purpura (HSP), gall bladder disease or Behcet's syndrome. The frequency of these illnesses is still very low in children.

Table 1

RED FLAGS

- Persistent vomiting or diarrhea
- Blood in the stool or the emesis]

- Fevers
- Weight loss or lack of appropriate weight gain
- Night waking with pain or diarrhea
- Joint pain
- Red sore eyes
- Mouth ulcers
- Unusual skin rashes, such as pyoderma gangrenosum erythema nodosum (inflammatory bowel disease, purpura (Henoch Schonlein purpura syndrome), dermatitis herpetiformis (Celiac disease))

Children with these illnesses rarely present with pain only and, on examination, the appearance is that of an unwell child, often with specific physical signs.

There are a variety of physical, yet common and non-serious, causes of chronic abdominal pain that can be diagnosed with careful history and examination, along with some thoughtful limited investigation. These causes include occult small bowel parasitic infection, lactose intolerance, mesenteric adenitis, post-viral gastritis, chronic yersinia and chronic mild constipation.

In children with mild recurring diarrhea or gassiness, parasites or lactose intolerance are frequently the cause. A definitive exposure is not always apparent in parasitic infections. Lactose intolerance usually presents in early adolescence, and is much more common in Asian, Mediterranean and Native American populations. Collect a stool for ova and parasites (O&P) examination, as well as for reducing substances (i.e., undigested sugar). Make sure the parent collects the loosest stool possible, as this will increase the yield of positive diagnoses. The author instructs parents to wait even several weeks to collect a sample if the diarrhea is infrequent. A trial period of lactose avoidance is often very helpful. Lactase enzyme-treated milk, hard cheeses and yogurt have very little lactose and can be consumed freely. Lactase enzyme pills or drops can be used when other forms of dairy food are consumed.

Mesenteric adenitis and post-viral gastritis often have a very definite beginning after an acute viral infection. There usually is minor peri-umbilical or hypo-gastric tenderness upon abdominal examination. Usually, with these two illnesses, the pain is by far the most prominent feature accompanied by some loss of appetite or even mild nausea. In mesenteric adenitis, stools may have scant amounts of blood, but the child will appear well between attacks of pain and should not lose weight. An abdominal ultrasound may show a large number of enlarged lymph nodes in the mesentery, but a negative ultrasound does not exclude this diagnosis.

Additionally, these two causes of recurrent pain are usually short lived, compared to the others. Often, by three months (the true duration of pain within the

technical definition of chronic recurrent abdominal pain), these two illnesses are already getting better. Of course, most families do not wait three months before seeing their doctor about their child's recurring abdominal pain.

Yersinial infection in the terminal ileum is in the classic mimic of Crohn's disease. There is usually an acute episode of gastroenteritis preceding pain in chronic yersinia, but it may or be mild and, therefore, not reported or felt to be of minor significance by the parent. Unless stools are obtained for culture during the acute phase, it is sometimes very difficult to document yersinial infection, as the yield from cultures taken later in the illness is very low. Some medical centers have serology available for yersinia, but again, the specificity and sensitivity are not definite enough to link yersinia directly to the current episodes of abdominal pain. Except in rare cases with systemic involvement and profound illness, yersinia is self-limited, with a typical duration of six months of recurring abdominal pain.

Upon examination, the right lower quadrant may be tender. An upper GI barium study, which is often done because of the discreet right lower quadrant tenderness, will show inflammation in the terminal ileum. This, however, does not help in differentiating this illness from Crohn's disease, so blood work, including a complete blood count (CBC), erythrocyte sedimentation rate test (ESR), liver function tests and albumen, should be done. Ultimately, many children with this variant of chronic pain will have a colonoscopy because of the difficulty in definitively ruling out Crohn's disease.

Chronic mild constipation is often a missed diagnosis. When we ask children or parents if the child has a normal stool habit, many times the child will interpret "normal" as what has usually occurred over the last six months, even when the stools may be either loose or firm. A parent is not usually involved in assessing stool habit at all in the older child or teen, as this is a very private issue for children of this age. Ask the child specifically about the firmness, regularity and frequency of the stool habit. If any doubt exists about the true stool habit, especially with younger children, ask the parent to verify the reports for a week by polite and respectful checks following bowel motions.

A rectal examination is an integral part of diagnosing chronic mild constipation, as the rectum is usually filled with stool and may even be slightly enlarged from chronic stool retention. An abdominal xray is, likewise, very helpful in documenting stool retention. No matter what the symptomatology, a rectal examination should always be done on every child with chronic abdominal pain. This routine part of physical examining can be made much less distressing for a child with proper preparation and a few simple measures. A rectal examination is painful if the examining finger is pushed through a tightly clenched sphincter when a child is afraid. You may want to enlist a parent's help to decrease a child's anxiety and give them a role to play in the actual examination.

The incidence of RAPC is quite with about 12% of girls and 10% of boys experiencing this problem at some time during childhood.

Getting children to do a valsalva maneuver will cause relaxation of the sphincters and allow an easy, painless examination. There are two simple ways of getting kids to do a valsalva: 1) ask them to blow out the light on your otoscope while a parent holds it; or 2) ask them to take a deep breath and hold it while a parent counts to 10 with them. Both of these maneuvers produce a nice valsalva to relax the anal sphincters, thereby allowing you to do a complete, but pain-free, rectal examination. If a child is still very afraid, ask the parent to do some preparatory work at home and then return to have the examination done. In younger children, using a doll or teddy bear to practice the position of lying on the side with legs curled up (fetal position) and breathing big breaths to help relaxation will help immensely. References to help parents with relaxation techniques for the anxious child are noted later in this article.

Table 2

PHYSIOLOGIC UNDERPINNING OF RECURRENT ABDOMINAL PAIN IN CHILDREN

- Lactose intolerance
- Increased intestinal permeability
- Abnormal small bowel motility (phase 111 contraction)
- High anxiety scores on personality inventories ;;

MAKING THE DIAGNOSIS

RAPC is a distinct syndrome of very real pain, with many consistent associated symptoms. Making a positive diagnosis of RAPC requires mainly a thorough history and examination. The incidence is quite high, with about 12% of girls and 10% of boys experiencing this problem at some time during childhood. Girls tend to present in the peripubertal years, whereas boys seem to show symptoms over a wider age range, beginning at about age five.

Many etiologies have been proposed and studied. Given that a great number of studies have documented different findings in different groups of children, it seems likely that this common syndrome has a variety of physiologic underpinnings. The variations in physiology and associated symptoms are helpful in guiding the physician's choice of effective treatments and, therefore, they are worth exploring.

Explanation of these possible physiologic underpinnings of RAPC will help both the child and parent understand and feel comfortable with the diagnosis. Telling parents that long-term studies of children with RAPC indicate that they are at no greater risk of any physical GI illness also will reassure them that no distant physical harms will surface.

A variety of physiologic changes that have been documented in children with RAPC are listed in Table 2. Symptom correlation with these variants of physiology has never been strongly documented, but logistical associations are common and useful. For example, well-studied abnormalities of the phase III type of intestinal contraction may be associated with intermittent crampy pain, gassiness and irregular stool habit of RAPC, as well as irritable bowel syndrome (IBS) in adults. Likewise, the higher rates of lactose intolerance documented in some studies of children with RAPC concur with the improvements many patients experience with low-lactose diets.

The constellation of symptoms in RAPC also can be very helpful to the physician in making this diagnosis. The pain is usually peri-umbilical and can be insidious and mild, or quite acute and severe. The pain is often difficult for the child to clearly describe, as there is no clear pattern to the pain, nor clear and consistent precipitating or relieving factors. Associated symptoms are usually vague and inconsistent (i.e., nausea, vomiting, dizziness, variable stool pattern). Many parents and children will identify stress as a consistent precipitant. School-related stress is a frequent finding, and the pain may even lessen or disappear on weekends or holidays. Remember that even positive stressors can precipitate pain (e.g., excitement about a hockey game, field trip at school or party).

Some non-GI symptoms frequently occur with RAPC. Headaches (usually tension), growing pains and carsickness are common. Dizziness also is a frequent complaint, but its consistency and relation to the usual factors causing dizzy sensations is usually absent. Many children are described as high achievers, worriers or more anxious than their peers. They often do very well at school and put a great deal of effort into school success.

Historically, a parent may have experienced similar problems during childhood or even suffer from IBS currently. Taking a detailed social history is crucial, as many families deal with significant and quickly changing stressors.

HELPING WORRIED PARENTS

The problem of RAPC is usually very worrisome for parents and the author finds many are very concerned about what may be causing their child's distress. While parents often interpret the longevity of the pain as an indicator of how serious the cause must be, the opposite is often the case. A long history of pain, but no other problems, combined with normal growth is a reassuring sign that no serious cause exists.

Additionally, families are reassured by appropriate explanations of how RAPC is thought to occur and the knowledge that this syndrome is well studied and documented. The concept of significant chronic pain being caused by physiologic, rather than pathologic, phenomena is sometimes difficult for families to understand initially. The physician must explain how acute and chronic pain work in order to help them understand how their child could be in distress without having a physical ailment.

HOW DOES THE GUT SENSE PAIN?

The nerve supply to the stomach, small bowel and large bowel is structured in a way that makes it difficult to localize pain to a specific location. Pain from both the upper and lower GI tract is most often felt around the umbilicus for this reason. In general, the further from the umbilicus the pain is, and the more localized the pain, the more likely it is to be of organic origin. Well-localized pain, such as the point-specific right lower quadrant pain in the later stages of acute appendicitis, is due to pain sensation in the peritoneum that lines the abdominal cavity. These nerve fibers, very different from those that supply the bowel, are quite specific at localizing pain.

School absence or withdrawal from other activities is common in children with RAPC.

The gut does not have nociceptors (specific sensory nerve endings for pain). The feeling of pain versus just the comfortable sensation of contraction and movement of fluid and gas is carried in the same nerve fibers. The perception of pain by the brain is thought to relate to the intensity of the signals traveling in the nerves from the gut to the brain. What makes one child feel discomfort and yet another a comfortable, but distinct, sensation from the gut is not completely understood.

The relationship of other stress factors is likely highly important. The common fears and anxieties every child experiences are felt to be involved in changing normal comfortable sensations to uncomfortable or painful ones. Remember that, in the rapidly changing world of a child, there are continual simple stressors. These may be as simple as the questions asked in the classroom or regular tests and evaluations. In comparison, most of us, as adults, do a job we know well, are less often called upon to demonstrate our knowledge to peers and only undergo formal evaluation on very limited occasions. These normal situations of childhood can easily precipitate unrecognized stress in the child with RAPC.

Lastly, the simple anticipation of recurring pain, compounded by a child's or parent's inability to effectively stop the pain, is often central to producing profound distress.

School absence or withdrawal from other activities is common in children with RAPC. It will serve to heighten anxieties in a family. Pressure mounts to return the child to daily routines, which may be complicated by worrying about catching up on missed school work. The reintegration of a child into his/her peer group after an absence also can be very anxiety provoking, especially if the child feels an explanation of the illness is required. This scenario only tends to increase the burden of pain and distress.

EASING THE PAIN

The management of distress is the primary role of the physician and family. It is important to rule out physical ailments, but this is just the beginning. There are a great variety of pain management mechanisms— from pharmacologic to physiologic to psychologic—that can be used. A thorough understanding of the pattern of pain, and the associated family and school social stressors a child is experiencing, will help you to structure an effective pain management plan. The initial goal should be a reduction in the level of distress, whether it is the frequency or severity of the pain. Eventual resolution of the pain or reliable methods of control when it does re-occur are the long-term goals.

UNDERSTANDING THE PAIN

A pain diary is of great help to everyone involved. Have a child rate pain on a scale of one to 10, or for younger children, by choosing progressively more unhappy and distressed cartoon faces. Record episodes of pain on a pocket or wall calendar, with simple notes about when and how the pain occurred. Use this same method to track success when on the treatment program.

HELPFUL MEDICATIONS

The use of regular medication should be seen as short-term acute relief of distress, with a gradual progression to only the occasional need for medicine, as the none pharmacologic techniques for pain control are learned and mastered. Analgesics, such as acetaminophen, are very appropriate for significant pains, similar to the management of a headache. Chronic daily use is not y appropriate. Nonsteroidal analgesics should is be used with caution, as they can inherently t cause GI distress.

The use of motility-altering agents, such as trimebutine maleate or pinaverium bromide, can be very helpful in the group of children with symptoms similar to adult IBS. These children often have a variable stool habit, with both loose and firm stools, as well as times of bloating or flatulence. Increased abdominal

cramping and loose stools will typically coincide. These medications are effective if initially used on a daily basis to establish good symptom control, and then used intermittently once pain frequency and severity has decreased.

The antihistamine, cyproheptadine hydrochloride, has been used for many years for both childhood migraine and in RAPC. Its mechanism of action is not well understood. The primary side effect experienced by children is that of increased appetite. Again, initial daily use (three times a day) is most effective for approximately one month, and then many children will achieve good pain control by using it at the beginning of only the more severe episodes of pain. A dosage of 1 mg three times a day for ages three to six years, 2 mg three times a day for ages six to 12 years, and up to 4 mg three times a day in children 12 years and over is appropriate. Narcotic analgesia should not be used in RAPC.

LONG-TERM MANAGEMENT STRATEGIES

Given the expected chronicity of RAPC, the ideal long-term management is nonpharmacologic. Physiologic modulation of nerve sensory input and psychologic methods of pain control are both highly effective. These techniques will take some effort for the family to learn, but their success is by far the best and free of side effects. The techniques range from nerve stimulation, using the gated theory of pain, to relaxation therapy, imagery and even hypno-analgesia.

THE GATED THEORY OF PAIN

The afferent nerves of the gut can only carry one signal at a time. If you can modulate the sensation that they are picking up and carrying to the brain, you may be able to very effectively diminish pain sensations. This is no different than the use of transcutaneous electronic nerve stimulation (TENS) or sterile saline injections, which are used to control pain during labor in childbirth.

Simple time-worn measures, such as warmth (hot water bottle) applied to the abdominal wall or gentle massage of the abdomen, are examples of this technique. An additional method is the use of a cool, mint or wintergreen-flavored antacid. The combination of the cool temperature and mint sensation often is very effective in relieving pain for children. Cool or warm liquid of any variety also can be tried as a soothing measure.

USING THE BRAIN TO CONTROL PAIN

Our brains modulate an incredible array of physiologic events in our bodies. The sight or smell of food can cause us to produce increased saliva for digestion long before we even take the first bite and taste the food. Excitement and exhilaration are known to make a person unaware of a painful injury. Fear can make us feel cold, our hair stand on end and even dilate our pupils and increase resting muscle tone. All of these examples can be used as examples to help families

understand how powerful the brain is at changing our body's function and response to the environment.

Psychologic methods of pain control have been pioneered and used for many years in patients with disease-related chronic recurrent pain. The same techniques can be used to control a constellation of everyday benign pains and discomforts. The type of technique used depends upon the age of the child, ability of the family to effectively master the technique and, most importantly, the preference and direction of the child experiencing the pain.

Imagery is very useful in children of all ages and includes such modalities as guided mental imagery, hypnotherapy, relaxation training, music imagery and suggestion. Imagery is the employment of the imagination and a gathering of all the senses. In essence, it may allow a child to experience or leave behind his/her pain without conscious scrutiny, which invokes feelings of anxiety, fear or despair. By lifting this conscious filter, new ways of managing and relieving pain can be learned or suggested. The type of imagery used is dependent on the age of the child, and can involve either focusing on the painful experience or providing a distraction.

An example of focusing on the pain is to have a child create a mental image of where the pain is and how it feels. Then, have them imagine an ice cube in the center of the pain, slowly melting in warm sunshine, and as the ice melts, they will envision the sun-warmed water as it spreads over the pain and helps it fade. This technique uses focused imagery and a suggestion of pain relief commonly used in hypno-analgesia. It is a more complex method of imagery. Simpler methods often use distraction rather than focusing, and may involve the imagination of a favorite place (children six years and up) or even a happy situation, such as many soft teddy bears (children five years and under) providing a safe and comfortable place for the child to retreat if pain is experienced.

Most of these techniques are best learned and practiced with the involvement of a pediatric psychologist. Your local children's hospital or health center will have a department of psychology and your province or state will also have an association of licensed pediatric psychologists that can direct you to a professional in your area. If a psychologist is not available in your community, many family or play therapists have excellent skills in many of these treatment modalities. There are many more methods of pain control, which these professionals can explore with children.

In addition to the referral to a psychologist, the author suggests parents begin to read about the syndrome of RAPC, as well as how the body senses and interprets pain and, of course, how to manage it. Most parents feel both far more comfortable and more enabled to deal with the pain when armed with this additional knowledge. Several excellent resources are available, and are listed in the suggested reading at the end of this article.

Video- or audio-formatted information is always popular and very convenient and efficient for families. Dr. Leora Kuttner, a highly respected author on childhood pain, is currently producing a video-formatted tool that may soon be available.

When using imagery or other psychologic methods of pain management, it is important to set realistic goals. The initial objective should be to achieve a degree of pain control and strive for more complete and profound relief of all distress. It is not always possible to stop the pain entirely in the short term. The beauty of these methods of pain management, however, is their transportability and accessibility to the child. When using only medication for pain control, it must be requested from a parent, caregiver or teacher.

For the child in pain, having to ask for medication may bring about perceived negative repercussions for complaining, may reinforce the role of suffering without the ability to control pain, and will increase anxiety when the child anticipates the next painful event in this recurring cycle. This is similar to the well-understood model of medical pain management, where we have moved away from waiting for a patient to ask for analgesia in a hospital setting (i.e., postoperative pain) to administering it regularly and sometimes having the patient dispense it (percutaneous continual analgesia [PCA]) before significant discomfort has recurred.

We recognize this model of pain management—where we offer the patient some control over their discomfort and do not let them return to a point of significant distress before helping—to be far superior. The more comfortable the child and parent are with their mastery of these pain management techniques, the less anxiety there will be when the pain returns.

KEEPING AN EYE ON THE HORIZON

What happens to pain for the many children with RAPC? In long-term follow-up studies, we see three different patterns. About one third of children will report the pain has disappeared completely by late childhood, one third will experience very significant reductions in distress, but still have occasional symptoms that can be well managed by the use of any of the above measures, and one third may continue to have recurring symptoms into adulthood and may even develop true IBS. The importance of learning strong consistent methods of pain control is clear when we see that two-thirds of children will use these over the long term to maintain comfortable, happy lives.

Reassure parents that children with RAPC do not have any increased risk of physical GI disorder, such as ulcers or IBD. They should, however, always check with their doctor if there is a change in their child's symptom pattern, especially if any of the red flag symptoms or signs occur.

Regular visits to review pain management and share successes are important. In the maintenance of a strong therapeutic relationship, the patient should not feel that they may only return if things are a lot worse. Regular visits will help in identifying changes early, so the treatment plan can be modified quickly. Reports of successful management techniques will help you in structuring further ideas for pain control. Try to build a strong pain management team, consisting of the patient, family, physician and psychologist.

SUMMARY

Chronic recurrent abdominal pain is one of the most common reasons for a child's visit to the doctor. Only a minority of children will have a physical illness causing their distress, and of these, only a small number will have a serious long-term illness. A careful history and examination will identify those likely to have a physical problem that can be assessed and treated. The majority of children will have a well-described syndrome called RAPC, which has a huge variety of very effective treatment options. Becoming familiar with these treatments, and with the other health-care professionals who are skilled in them, will enable you to address a child's abdominal pains quickly and effectively.

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