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CHRONIC ABDOMINAL WALL PAIN: A MISSED DIAGNOSIS

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Chronic abdominal wall pain (CAWP) refers to the pain originating from the abdominal wall which is often misdiagnosed as arising from a source inside the abdominal cavity, often resulting in inappropriate diagnostic investigations, unsatisfactory treatment, and considerable costs. In spite of being implicated in as many as 10% of patients with chronic abdominal pain of unknown cause seen by gastroenterologists, this condition has received little research and clinical attention (1). Thompson et al estimated that about 1% of all referrals for chronic abdominal pain made to a general surgeon were eventually considered to be CAWP (2). In a study of patient referrals to gastroenterologists over a 5-year period, Costanza et al showed that CAWP comprised 7.8% (133 of 1708) patients referred with abdominal pain. Referring physicians were able to suspect CAWP in only 3% of their patients, which suggests the relative unawareness of this condition (3). By contrast, physicians aware of this condition have reported seeing between one to two such patients in a week to three per day (4). Even in 1926, when Carnett first described the examination process to differentiate pain of abdominal wall origin from intra abdominal pain, he commented on CAWP being a frequently missed diagnosis (5).

What is within the abdominal wall?

The most important cause of CAWP is entrapment of a branch (anterior cutaneous) of one of the lower thoracic (T 7-T 12) intercostal (rib cage) nerves in its tortuous course through the abdominal wall muscle. After turning at a 90º angle, the nerve passes from the posterior sheath of the abdominal wall muscle (rectus abdominis) through a fibrous opening and then branches at right angles while passing through its anterior sheath. It has been thought that the underlying problem is nerve compression with resulting ischemia or lack of blood supply, explained by the nerve's course through the muscle. Applegate termed the condition as "anterior cutaneous nerve entrapment syndrome" and suggested the entrapped nerve may also be pushed by intra- or extra-abdominal pressure or pulled by a scar causing pain in the abdominal wall (6). Other diseases affecting the nerves such as diabetes, herpes zoster, trauma, and rarely cancer may also cause symptoms of CAWP (1). Occasionally abdominal wall hematomas (blood filled collections), hernias and painful rib ("slipped rib") may account for abdominal wall pain (7).

How is abdominal wall pain diagnosed?

CAWP is most commonly diagnosed on the basis of a patient's history and a physical examination. CAWP more commonly involves right side of the abdomen and may be at or close to an old surgical scar or, in the absence of a scar, it is frequently at the outer edge of the abdominal muscle (rectus abdominis). The pain experienced is usually sharp and there is often extreme tenderness upon gentle stroking or pinching in that area of the skin. The patient may guard the area from light touch, sometimes by seizing the examiner's hand. The pain may extend backwards and up to the vertebral body if its origin is related to nerve root in the spinal cord. An important finding is that the pain may be so sharply localized that a

patient can cover the tender spot with a fingertip, and the area of severe tenderness is often no more than 2cm in diameter, although mild discomfort may be more dispersed. This almost always indicates that the pain originates in the abdominal wall, since intra abdominal pain is usually not as sharply localized (8). The pain may be exacerbated by conditions that can cause nerve pressure or traction, such as tight clothing, obesity or post-operative scarring. Relief may be obtained by sitting, lying or relatively frequently by hand-splinting the affected area. Patients may report that standing, lifting, stretching, and coughing worsens the pain. Other things such as nausea, bloating, overeating, and menstruation can make pain worse by causing congestion of blood vessels and further nerve compression (1). Oral contraceptives and pregnancy have also been reported to increase abdominal wall pain, probably from hormone induced tissue swelling (9).

Carnett's test is the key in a physical examination for diagnosing abdominal wall pain. A positive test is demonstrated by palpating the tender region in the prone (lying down) relaxed patient and observing continuing or often increased tenderness as the patient tenses the abdominal wall by elevating the head and shoulders or raising their legs. When pain arises from an intra abdominal source, the tensed muscles in the abdominal wall guard the underlying bowel, thus reducing the discomfort (negative test). However, when the pain arises from the abdominal wall, the muscle contraction will accentuate the pain (positive test) (5). The criteria for diagnosing CAWP proposed by Greenbaum et al, when tested in 33 patients with CAWP as compared with 62 patients with intra abdominal pain, had sensitivity of 85% and specificity of 97% which usually means that the clinical methods used were good enough to diagnose CAWP in most of cases and to rule out other possible diagnoses (Table 1) (10). Sometimes, intra abdominal disease with involvement of peritoneum (membrane lining of the abdominal cavity) may give a false positive Carnett test. It is also not very useful to apply this test to individuals with widespread abdominal pain rather than localized area of pain to avoid misdiagnosis.

The reliability of CAWP diagnosis is high if the patient history and physical examination are highly suggestive.

In addition, significant (> 50%) pain relief after an accurately placed nerve block or trigger point anesthetic injection (to numb the area) is considered confirmatory of CAWP diagnosis. Various reports have found 70-90 % pain relief after a correctly placed nerve injection (1). Sharpstone et al concluded that a successful injection after a positive Carnett sign (to diagnose CAWP) "must be one of the most cost effective procedures in gastroenterology" (8). However, this approach is not completely flawless because of the high (30%) placebo effect with injections (11), and is beneficial only in settings where appropriate diagnosis of CAWP using other clinical criteria can be made.

It is important to recognize that the presence of CAWP does not always rule out an existing intra abdominal source of pain and misdiagnoses have been reported. For example, Thompson et al noted that 4 of 62 (6%) patients diagnosed with CAWP were later found to have an intra-abdominal cause of pain (2). Gray et al reported that 5 of 53 (9.4%) patients with positive Carnett test actually had appendicitis (12). Of interest, one study also demonstrated the presence of irritable bowel syndrome and functional dyspepsia (indigestion) in 29% and 11% of patients with CAWP, respectively (3).

What can be done about abdominal wall pain?

The management of CAWP depends on the severity of symptoms. In cases of mild pain, minimizing activities that aggravate the pain may be sufficient. An abdominal binder may be useful if gentle hand

pressure helps ease the pain. Local nerve blocks or trigger point injections using anesthetic/steroid injections are the treatment of choice for patients with moderate to severe abdominal wall pain. To have optimal results, the patient is asked to precisely localize the area of maximum tenderness to determine the site of injection. The patient should also be told that intensification of pain would occur when the needle tip reaches the pain source, demonstrating the needle has been accurately placed. The injections are usually done with a 26-gauge 1.5 inch needle passed perpendicularly through the mark. The medication usually used is 2 ml of 0.25% bupivacaine (anesthetic-to numb) with 20-40 mg of triamcinolone (steroid), and no more than 10 ml of anesthetic should be used in one sitting to avoid side effects. Pain improvement usually occurs within a few minutes, but maximum effect may take up to 72 hours. Failure to obtain relief after injection may be due to (1) inaccurate placement of the needle tip, (2) nerve related pain arising from a different site, or (3) an alternative diagnosis (13). Up to 1/3rd of the patients may require a reinjection for pain recurrence, days to months later (1). Occasionally, in absence of relief from injections, nerve block injections with a different medication (5-6 % phenol) may be tried (14). Rarely, surgical procedures like sectioning or freezing the entrapped nerve may be required to obtain relief.

Conclusions

CAWP should be suspected when chronic abdominal pain is narrowly confined to a small area. Its most common cause is an entrapped anterior branch of one of the thoracic nerves but it may also result from surgical scars, hernias etc. The diagnosis is made by patient history and physical examination, especially Carnett test, and there is pain relief after a properly placed anesthetic/steroid injection in more than 2/3rds of patients. Intra-abdominal disease is infrequently missed if patients are closely followed after an initial diagnosis is made, but CAWP may co-exist with intra-abdominal disease processes. The diagnosis of CAWP is uncommonly made by physicians, despite its relative frequency in general practice. The condition should be considered as one of the possibilities in a patient with chronic abdominal pain.

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