

Review

A systematic review of the treatment for abdominal cutaneous nerve entrapment syndrome



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Abstract

BACKGROUND: Abdominal cutaneous nerve entrapment syndrome (ACNES) is a frequently overlooked cause of chronic abdominal pain. We aim to outline the current available literature concerning the treatment of patients diagnosed with ACNES.

DATA SOURCES: A systematic search in PubMed, EMBASE, CINAHL, and Cochrane databases was performed. Seven studies were included; describing trigger point injection (TPI) or anterior neurectomy as stand-alone procedure, TPI followed by anterior neurectomy as stepwise regimen, and nerve stimulation and phenolization. After TPI, 86% of the patients showed successful response, 76% at long-term follow-up. Two other studies report successful treatment in 50% of patients. In the included trial using anterior neurectomy, 73% vs 18% of the patients demonstrate a successful pain response in the neurectomy and sham group, respectively. Two cohort studies showed that 69% and 61% of the neurectomy group reported to be satisfied at 18 months and 32 months follow-up, respectively.

CONCLUSIONS: There is significant pain relief after injections and anterior neurectomy. Awareness of the diagnosis is important. The validity of currently used diagnostic criteria needs to be evaluated in additional studies.

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Chronic abdominal pain is a frequently encountered problem among primary care physicians, gastroenterologists, and surgeons. This complaint is responsible for multiple consultations, and patients are exposed to additional laboratory tests and diagnostic investigations, thus

causing burden for patients and increasing health care costs.^{1,2} Recent studies have shown the abdominal wall to be the primary focus of chronic abdominal pain in up to one-third of patients suffering from chronic abdominal pain.^{3–6} A relevant part of patients previously diagnosed with functional abdominal pain, including irritable bowel syndrome (IBS), appear to suffer from an abdominal wall syndrome.⁵ Abdominal cutaneous nerve entrapment syndrome (ACNES), also known as anterior cutaneous nerve entrapment syndrome, is occasionally diagnosed as the primary cause of abdominal pain, with a reported incidence of 2% among patients presenting with acute abdominal pain to the emergency department.^{3–7}

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In 1926, Carnett and Bates were the first to report on different types of neuralgic pain and tenderness of the anterior abdominal wall simulating various acute or chronic intra-abdominal infectious disorders or visceral lesions. In the following years, it has been hypothesized that through entrapment of the superficial branches of the intercostal thoracic nerves between abdominal muscles, ACNES causes pain simulating pain derived from intra-abdominal pathology.⁸

Since the introduction of ACNES as a possible cause of (chronic) abdominal (wall) pain, numerous studies have been published, reporting on the prevalence, diagnosis, and treatment of this frequently forgotten cause of abdominal pain.

Through this systematic review, we aim to outline the current available literature concerning the treatment of patients diagnosed with ACNES. Furthermore, we aim to increase the awareness of physicians for this condition as a possible and treatable cause for (chronic) abdominal pain.

Methods

Literature search

Two authors (J.E.O. and C.U.) performed an independent literature search to identify studies investigating the treatment of patients diagnosed with (chronic) abdominal pain caused by ACNES. MEDLINE databases were searched for articles published up to January 2015, using the following search terms: (chronic abdominal wall pain or cutaneous nerve entrapment or ACNES) and (abdomen [MeSh] or abdomen or abdominal or anterior or intercostal). EMBASE database was searched using the terms: (chronic abdominal wall pain or cutaneous nerve entrapment or ACNES) and (abdomen or abdominal or anterior or intercostal). CINAHL database and The Cochrane database of Systematic Reviews were also checked for relevant studies with the following keywords: ACNES and anterior cutaneous nerve entrapment syndrome. In the systematic review, only studies published in English were considered eligible.

Quality assessment

After identifying all relevant titles, the abstracts were read and eligible articles were retrieved. A manual cross-reference search of the references of relevant articles was performed to possibly identify other studies not found in the search. Unpublished data were not included. A full search strategy is available at request. The methodological quality was independently assessed by two authors using the checklist of the Cochrane collaboration and methodological index for non-randomized studies (MINORS) quality score, with a global ideal score of 16 for non-comparative studies.⁹

Definitions

The diagnosis of ACNES was defined as (chronic) abdominal wall pain, with precise location of the pain and a positive result on Carnett's test, with intra-abdominal origin of pain unlikely after negative laboratory results and imaging.¹ Carnett JB and Bates W¹⁰ introduced the Carnett's test for diagnosing ACNES, in which after palpating the abdomen to identify the specific area of maximal pain, the patient is asked to raise the head and shoulders, causing contraction of the abdominal (wall) muscles. When reapplying pressure to the previous identified area of maximal pain causes an increase in pain, the Carnett's test is found positive, with the source of the abdominal pain most likely to originate from the abdominal wall.^{1,10}

Inclusion and exclusion criteria

Articles were eligible for inclusion if the following criteria were met: randomized controlled trials (RCTs), retrospective studies, and case series describing the treatment of adults diagnosed with ACNES, articles in English, human studies, and available full text. Abstracts, case reports, studies describing pediatric patients, and non-English articles were excluded based on our exclusion criteria. Studies describing pediatric patients were excluded to reduce the heterogeneity between the included study populations, making it possible to adequately compare different treatment strategies.

Types of participants

Adult patients undergoing treatment for abdominal pain caused by ACNES.

Types of outcome measures

Primary outcome measure was the success rate of various types of treatment in terms of reduction in pain, most frequently reported using a visual analog scale (VAS), where 0 mm represents absence of pain and 100 mm indicates excruciating pain, and a verbal numerical rating scale (VNRS), where a score of 0 represents no pain and 4 indicates severe pain.

Results

Description of studies

Fig. 1 demonstrates the flowchart for the conducted systematic review following the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines. A total of 296 publications were identified from the primary search, from which 183 articles were screened based on the title or abstract. In total, 23 articles were

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