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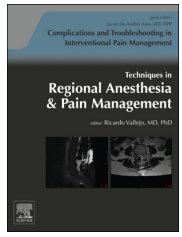

Diagnostic nerve block and trigger point complications

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ABSTRACT

Diagnostic nerve block complications are fortunately uncommon but they can have serious consequences for both the patient and the doctor undertaking the procedures. The best treatment involves both prevention and early recognition given that the real danger of complications lies not in their appearance but rather a lack of diagnosis as well as the need for a fast and suitable treatment. This article reviews the technical aspects, the anatomy, and the pathophysiology of complications, as well as their prevention and how to minimize their effect on the patient.

Introduction

Chronic pain is defined as pain lasting for more than 6 months that does not respond to conventional treatments, either after injury or during the natural course of a disease. It is a multifactorial, complex phenomena and is always organic, involving both physical and mental factors.[1] Interventional techniques aim to diagnose and treat the pain process using a multidisciplinary approach.[2]

Block complications are fortunately uncommon but they can have a great effect on both the patient and the doctor undertaking the procedure. The incidence of serious complications leading to permanent damage is 1.5 per 10,000 blocks. Most of the injuries are transient and often subclinical. The incidence of paraparesis in the immediate postblock period is approximately 8%-10%. The intraneural injury, feared by interventional doctors, occurs despite the use of stimulation and ultrasound, but it does not necessarily lead to permanent nerve damage.[3] The ultrasound is able to show whether the injection is perineural (outside the nerve), intraneural (under the epineural nerve), or interfascial (between the nerve fascicles), meaning the relationship between the different complications can be determined.[4] The incidence of complications has not reduced despite the use of support measures, being no different to when a blind procedure is undertaken.[5]

Local anesthetics (LAs) are the only drugs capable of completely stopping the pain. The aim with precise diagnostic blocks is to find the etiology and pathophysiology of the pain for the patient to obtain partial or complete pain relief once LA has been applied in the chosen target. Most of them

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should be sustained with the application of at least a second block anesthetic with a different duration, and even a third if placebo is used. Failure with the second block indicates a false positive from the first.[6] The duration of the block in patients with chronic pain may be different for anesthesia; long-acting blocks with lidocaine have been observed in patients with neuropathic pain.[7]

Nerve block

It is defined as complete and irreversible interruption of the pain pathways through application of a LA. Neurolytic agents are used in certain situations, such as chronic pain and pain of neoplastic origin, leading to a "permanent" interruption in nerve conduction. The blocks are indicated for the diagnosis and treatment of acute and chronic pain.[8]

The interruption can be applied at the start of the pain pathways: peripheral receptors, along the neural tract, at the nerve source in the spine, blocking the autonomic nervous system, and as such, blocking the accompanying afferent fibers. The block also interrupts some abnormal reflex mechanisms responsible for certain pain conditions, such as pain carried by the sympathetic nervous system and complex regional pain syndrome, among others.[9]

Nerve block indications

They are indicated in the diagnosis and treatment of acute and chronic pain. Depending on the need, blocks can be diagnostic, prognostic, prophylactic, and therapeutic.[10]

Diagnostic block
It helps us to locate the etiology and pain pathways, undertaking a differential diagnosis of the cause and location of the pain.[40] We can differentiate whether a pain is somatic, ischemic, or visceral and peripheral, central, or referred.

Prognostic block
It allows the patient to experience sensations that may remain after a neurolytic block, conventional radiofrequency, or surgery; whether pain relief or residual effects, aiding their decision. It cannot be used to determine analgesia duration, given that despite undertaking "permanent" techniques, the pain reappears after weeks or months, which is down to the development of alternative anatomical pathways that perpetuate or even worsen the pain.

Prophylactic block
We can use the nerve block to reduce and prevent postoperative, traumatic, ischemic, and visceral pain complications. Complex regional pain syndrome, postherpetic neuralgia, and postamputation pain are just some examples where possible chronic pain conditions are prevented by undertaking continuous prophylactic blocks.

Therapeutic block
The blocks are effective in the treatment of self-limiting diseases that come with intense pain and to break the so-called viscous circle of subacute and chronic pain, experienced by patients with causalgia, complex regional pain syndrome, or myofascial pain, with reflex muscle spasm. They turn out to be useful for the treatment of postoperative pain, posttraumatic pain, ischemic and vasospastic pain from arterial embolism, pain from Raynaud disease, thromboangiitis obliterans, freezing, acute herpes zoster infection, and phantom limb pain. Other indications include peripheral blocks to treat scapulohumeral periarthritis, coxarthrosis, intercostal neuralgia, *trigger* points among others, and epidural blocks for pancreatitis and back pain. They also aid and improve the rehabilitation of extremities.[11]

Neurolytic blocks with alcohol on the celiac plexus and the splanchnic nerves are routinely used for visceral pain from visceral cancer pathology in the upper third of the abdomen, usually involving the pancreas, and also the liver and the stomach; they are also used on chronic pancreatitis. Chemical sympathectomy with phenol is useful for treating lower extremity ischemia and is a much less aggressive and more comfortable method than surgery is for the patient. Phenol sacral nerve blocks are used on perineal pain and neoplastic vesical and rectal tenesmus from bladder, rectal, and prostate cancer, as well as gynecologic pain. A superior hypogastric plexus block with phenol is used for the same condition but with a nonmalignant origin.[12]

Basic application requisites

To undertake a successful block and reduce or avoid complications, the doctor, patient, and blocks themselves must fulfill some minimum requisites.[13]

The physician

- Before undertaking a block, we must be sure that we understand the pain syndrome and all the appropriate diagnostic and therapeutic methods for each patient, as well as their clinical history.[14]
- The doctor undertaking the technique must have extensive knowledge of the nervous system, the techniques to be undertaken, the drugs, complications and their solutions, and the advantages and disadvantages of the method.
- The outcome of the block must be rigorously monitored.

The patient

- Patients should be carefully selected.
- They must understand and give consent to the whats, whys, and hows of their prospective treatment when it comes to both the analgesia and the side effects and complications.
- They need to collaborate; they should remain calm and still and should not have mental issues or addiction to drugs or alcohol.

The blocks

- The pain must be localized. Support measures have to be used to precisely locate the nerve to be blocked, as well as