CMECD® Practice Considerations

Questions of availability for use warrant a few words. In the US, phenoxybenzamine can be used off-label under FDA guidelines that simply require a scientific knowledge of its potential benefit, a patient consent that indicates that it is an off-label use and keeping records of complications. Fortunately, complications are extremely rare. Care needs to be taken in the injection of muscles that overlie the chest to prevent a pneumothorax. Carotid and vertebra arteries require caution in neck injections. Closed spaces such as fingers and hands should be avoided as reactive swelling that may occur could impair blood flow.

It is known that repeated use of Botox can lead to muscle atrophy. I personally received at least 10 back injections of phenoxybenzamine without any subsequent weakness. A persistent post laminectomy syndrome required frequent back injections with an ultimately successful outcome. Muscle that had been cut in surgery when healing presumptively develops new postsynaptic alpha-adrenergic receptors more rapidly than in a basal state, limiting the duration of action to only 2-3weeks rather than 2-3 months.

The question of which individuals are likely candidates needs to be addressed. (49) In my experience a very high percentage of patients with chronic pain have chronic muscle spasm as the primary or secondary cause. It did not seem to matter how long the chronic pain had existed. Typically, it was 1 to 5 years. One individual had chronic spasm for 37 years that resolved with the injection never to recur. Statistical evaluation of my survey data set supported that finding.

The question of limitation of physical activity following phenoxybenzamine is of significant importance. (50) In theory the longer a muscle has been in spasm the more loss of cellular elements would occur up to some point of equilibrium. Restoration of activity with relief of pain should be gradual to prevent the reoccurrence of spasm by overstressing the recovering muscle. Reinjection of any muscle is rarely if ever warranted. Only if repeat overuse injury or traumatic injury occurs. The concept of acute traumatic muscle spasm is fascinating but beyond the scope of this talk. In brief, (51) acute traumatic muscle spasm appears to have some survival benefit as may occur in a fractured limb to assist healing. However, the continued presence of chronic muscle spasm long after recovery from a traumatic injury is not helpful to the individual. Chronic back pain and chronic back muscle spasm following a motor vehicle accident is not only common but one of the major indications for use of opioid medications. Treatment with the CMECD® procedure has been useful but requires careful evaluation to decide which of the multiple muscle groups that were activated by the accident warrant treatment by this method.

Obstacles to clinical use include primarily lack of a random controlled clinical trial and to an extent the lack of reliable insurance coverage. A Phenoxybenzamine/dexamethasone mixture is available in the US in most states by overnight delivery from Miller Pharmacy, a New Jersey sterile compounding pharmacy licensed in 50 states. Phone 201-891-3334 Phenoxybenzamine should be able to be compounded anywhere in the world as the drug itself is used in treatment of cats. The cost per patient in the US for the compounded drug is currently $60. Needle, Lidocaine, and other disposables add another $20. (53) Current FDA policy for sterile compounded medications in the US required the compounded mixture be made for a specified individual and be used within 3 days. However, my experience is that it can be frozen for extended periods and maintains its activity.

Phenoxybenzamine is available to any licensed pharmacy from a company in Texas, USA. Their web site is PCCARX.com. PCCA phone numbers are 800-331-2498 or direct at 281-933-6948 and email at clientcare@PCCARX.com.

One other obstacle for clinical use is tied to the very benefit of the procedure, that is the absence of recurrence. Muscles in chronic spasm fully treated to eliminate SEA do not need a second injection for long term benefit. Financially, this may not be beneficial for the practioner unless compensated on an outcome basis. It should be great in countries with government health services but may not be welcomed in the US.

One indication for widespread use is the potential to limit the opioid crisis. None on the patients treated received any pain medication and a significant number that had been taking opioid medications were able to discontinue them.

A few comments regarding technique are in order. As mentioned before, the immediate effect of the injection is relief of the spasm and relief of pain. A single treatment is limited to the amount of muscle that can be treated with the 10ml dose of the compounded solution and the added 2% Lidocaine giving a total of 20ml of working solution. On occasion I have used more but not more than 50% additional. Phenoxybenzamine is an alpha blocker and can cause hypotension that can last 24 to 36 hours. Patients taking antihypertensive medications may need to hold off at least some of their medications on the day following treatment. I also try to make sure that the patient is brought to and from the office by a friend or family member. Multiple sites including different extremities and trunk sites are possible at the same sitting.

A new concept in treatment protocol and the reporting of treatment outcome is “Hierarchy of Pain”. This is a term that was coined by my wife Katheen, a psychiatric social worker, as she heard me drone on of my treatment outcomes. She realized that this phenomenon was present not only in pain but in the concerns, we deal with in everyday life. Two of my patients highlighted this phenomenon. The one patient after having relief of spasm in his right arm then stated that his left arm then hurt. This not unexpectedly took me by surprise. The second patient had relief of pain from her piriformis injection but then pointed to a second hip rotator that was painful. At this point I was not surprised as I had learned to expect the Hierarchy of Pain to be in play. I injected the second hip rotator providing relief only for there to now be a third hip rotator that when treated gave full relief. In practice as soon as one site has achieved pain relief, the next site with somewhat lesser pain site will be noted. This makes it a good practice, when possible, to treat the most significant pain site first. It is also key when charting pain relief to be as specific as possible regarding the site of pain as an adjacent site may readily confound the documentation of success. I also make it a habit to have the patient get up and move around halfway through the procedure both to access possible hypotension as well as to measure pain relief success and find the next most significant pain that may not have been previously obvious as was the case with the second patient. The CMECD® procedure should provide immediate relief, thanks to Lidocaine, and allows assessment of treatment adequacy. I recommend treating additional sites about 2 weeks after the initial procedure. At that point there should be no residual discomfort from the initial injection site which can last occasionally up to one week.

Detailed information regarding specific considerations for each of the muscles that I treated can be found on my website CMECD.info also reachable at OpioidNO.com under the chapter Step by Step.

I have just been introduced to 2D surface EMG that has come to a reality. It is not yet readily available secondary to cost and need for expertise but holds great promise to greatly facilitate the identification and location of chronic muscle spasm and minimize the “poke and hunt” nature of needle EMG.

<https://www.robertomerletti.it/en/emg/material/teaching/module10> images 40 and 45

I sincerely hope that a better understanding of muscle pathophysiology as it relates to chronic muscle spasm and pain will provide a basis for further research and treatment possibilities.

<https://www.cartoonstock.com/cartoon?searchID=CS214095>

Thank you for your attention,

Roger H. Coletti, MD

Primary Care Talk 5/29/23

Treatment of chronic pain represents a daily challenge in the practice of primary care. The overuse of opioid medication is at a crisis level. Alternatively, reluctance to provide adequate pain suppression because of new regulations and increased oversight further complicates patient care.

I am presenting today a method of treating chronic pain that can be used by any practitioner, has demonstrated outcome results and does not involve the use of any type of pain medication.

It has been my experience that chronic muscle spasm is the most frequent cause of chronic pain and is not generally responsive to typical anti-inflammatory agents or muscle relaxing agents.

My clinical research was to find the cause of chronic muscle spasm and develop a lasting treatment. Both of which were accomplished.

(2) What I discovered is that muscles that are in chronic spasm have sustained electrical activity maintaining the spasm indefinitely. What is known as SEA or spontaneous electrical activity appears to be the result of the initial muscle contraction squeezing off the muscle’s blood supply. If an overuse injury and muscle spasm is resolved in a few days, the muscle can tolerate the ischemic challenge and returns to normal. (3) However, when the overuse injury continues, the ischemic challenge sets off electrical activity within the muscle that then maintains the spasm. Over time there is gradual damage to the muscle with loss of mitochondria and muscle fibers. These changes have been found to be generally reversible but can require months to occur. What was needed was a way to stop the SEA long enough for the muscle to relax and repair.

My findings took advantage of prior work starting with (4) the Travel and Simon’s pioneering work on myofascial release and the experimental work of Hubbard with various agents to treat trigger points. I was successful in combining phenoxybenzamine with lidocaine to suppress the SEA with long lasting results. The injection procedure that I developed is named and trademarked as CMECD (Coletti Method of ChemoDenervation). It is free to be used by any physician and can be used under FDA guidance as an off-label use. It requires the use of an EMG device which is the major limitation. The phenoxybenzamine to which a small amount of the short acting steroid dexamethasone is added is available from a New Jersey pharmacy, Millers of Wycoff to anywhere in the United States. The cost per patients is currently $60 and the cost of an EMG injection needle is $20. For those outside of the US, phenoxybenzamine is available to any licensed pharmacy in the world from a company in Texas, USA by the name of PCCA and their contact email is clientcare@PCCARX.com. On site an equal volume of 2% lidocaine is added to the mixture before use. Current FDA regulations require the medication to be compounded for a specific patient and be used within 3 days. It is shipped overnight in cold packs and should be kept refrigerated. I have found that it can be frozen and have had successful results even after having been frozen for several years although that is outside of FDA guidelines. The fact is that I used that frozen solution on myself as I had severe back chronic muscle spasm resulting from my caregiving to my wife subsequent to a prolonged hospitalization.

The treatment requires EMG evaluation (5) and simultaneous injection of areas of muscle that demonstrate SEA. Very small aliquots of solution are injected into every area of muscle that demonstrates SEA. The SEA is rapidly abolished thanks to the antiarrhythmic effects of the lidocaine and the SEA remains suppressed for prolonged periods thanks to the covalent bonding of phenoxybenzamine to the afferent alpha nerve receptor. The receptors are permanently disabled and new receptors will replace them over weeks to months. The effective duration of action of the phenoxybenzamine is 2 to3 months. This is enough time for the muscle to at least mostly recover.

 <https://www.youtube.com/watch?v=f6npZiwNs7s>

<https://www.dropbox.com/s/ej7l8s0vvvtv2rf/IT%20Band%20Treatment.mp4?dl=0>

(6) In this video I am looking to treat the tensor fascia lata muscle that is responsible for an IT band syndrome. As I insert the needle there is typical insertional activity in the normal muscle. When I find the tensor fascia lata muscle you can appreciate the marked spontaneous electrical activity. The patient is at rest and without any voluntary activity. Also note that there is no evidence of discomfort from the needle insertion or injections.

Phenoxybenzamine is an FDA approved medication now only seldom used in the early treatment of a pheochromocytoma. It is an alpha blocker and its systemic effect is to lower blood pressure. This needs to be taken into account especially in individuals with low blood pressure or on blood pressure medications as the systemic effects last for up to 2 days. Phenoxybenzamine is also an irritant and soreness at the site is not uncommon for several days. Dexamethasone was added to the mixture to minimize the irritant effect.

What is most exciting about the procedure is the immediate and sustained relief of pain that accompanies the resolution of the chronic muscle spasm. As one site is injected, it is not uncommon for the individual to recognize pain at another less severe site. This phenomenon coined by my wife Kathleen as the Hierarchy of Pain, is critical to be aware of in any attempt to treat chronic pain. The physician needs to keep record in a geographic manner to assess results. My first encounter with this phenomenon was after injecting one arm and having the patient then immediately state that his other arm now was painful. Thereafter I took careful note and found this to be a near universal response to direct pain treatment.

Backing up a bit, the question is how you know where to begin looking for the correct place to start. Obviously, the complaint of pain is the first step. Muscle in chronic spasm is tender to compression. Granted there are some muscles, especially in the back, that are the cause of chronic pain and are too deep to compress. That aside the majority of muscles in chronic spasm responsible for chronic pain can be found and identified by response to compression. In some cases, the site of muscle spasm and site of pain are at some distance from one another. The most common occurs with IT band syndrome which is caused by spasm of the tensor fascia lata muscle in the upper mid-thigh and pain is usually at the knee. Cervical brachial syndrome is spams of the scalene muscles and the symptoms are mostly in the arm. (7) I make use of the book ”The Trigger Point Therapy Workbook” by Clair and Amber Davis as a starting point to identify muscles that generate pain at a distance. Muscles as deep as the psoas muscles can present with what feels to be superficial back pain. There is a learning curve to know how to find the source of pain, but whenever the injection relieves the pain, your search is ended.

Treatment under FDA guidelines (8) requires a consent form for an emergent procedure such as this should be extensive, identify the procedure as off-label and name possible side effects. There is one on my website CMECD.info. It probably could be revised at this point but at least one is available for use. FDA also requires that the physician understands how the treatment works, which you now do and keep track of any complications. That is all that is required.

In order to find true SEA, the patient needs to be put at full muscular rest, at least for the muscles being treated. Any voluntary muscular action can appear as SEA. (9) I make use of a massage chair for most treatments of the back or neck. I also have come to only use a 3-inch needle to minimize skin punctures. This allows me to treat an area nearly 6 inches in diameter with a single skin puncture. Surprisingly the penetration of the needle, after passing the skin, is well tolerated. is important not to leave untreated islands of SEA. It is better to thoroughly suppress one geographic area at a time and return if necessary for an adjacent area.

Complications with this procedure should be rare. Care needs to be taken when injecting muscles over the chest area to avoid penetration of the lung that could cause a pneumothorax. Neck injections should keep in mind the carotid and vertebral arteries. Regarding anticoagulation, I have had no complications with patients on blood thinners although needle sticks may require a bit of attention. I don’t recommend you start with such patients but should be aware that they can be potentially treated.

Now for some images.

<https://youtube.com/shorts/VtnIhnHmxPw?feature=share>

<https://www.dropbox.com/s/5qo909p7fgu394l/Normal%20Muscle.mp4?dl=0>

(10) EMG of normal muscle

This is what is seen in normal muscle at rest. There is minimal baseline activity but no significant action potentials.

<https://youtube.com/shorts/6MfVzhLW114?feature=share>

<https://www.dropbox.com/s/enzrzk2fyhouzez/Normal%20Insertional%20Activity.mp4?dl=0>

(11) Normal insertional activity

One does not need to be an EMG expert to understand significance of the basic EMG findings. The first thing you would notice is what is called insertional activity.

 When the needle penetrates the muscle, you will hear and see some activity. Normally the activity is very brief and stops immediately when movement of the needle stops. However, sometimes the needle sets off a train of action potentials lasting a few seconds. This is called increased insertional activity.

<https://youtu.be/LcLqwo1tS9A>

<https://www.dropbox.com/s/bcmxbzg5ezl1b3x/Increased%20Insertional%20Activity.mp4?dl=0>

(12) Increased insertional activity

The finding of increased insertional activity in my experience is associated with muscle that is not yet in chronic spasm but is demonstrating some membrane instability and may correspond to what have been called latent trigger points. In any case and most interestingly, insertions that set off increased insertional activity act like dry needling and in some cases can cause the muscle to relax even without the injection. I had a few cases of this sort when I would not inject anything without classic SEA and the patients got better just from the attempts to find the non-existent SEA. Without going into details, discussion, and theories, just know that there is evidence that dry needling can reduce SEA although not eliminate it. Multiple sessions may be adequate for treatment of chronic muscle spasm and pain and EMG guidance has been shown to improve the outcome. The advantage of the CMECD procedure over dry needling is immediate relief and sustained effect with one injection. Return patient visits are therefore not guaranteed. For the primary care physician, however, this should be a blessing not to have to continually deal with the chronic pain.

(13) Typical SEA in chronic muscle spasm,

<https://youtube.com/shorts/c-AroI0xGCc?feature=share>

<https://www.dropbox.com/s/df8slrlmk587odg/Typical%20SEA%20in%20Chronic%20Muscle%20Spasm.mp4?dl=0>

This slide demonstrates the typical SEA with a chaotic appearance. There are actually several types of electrical events going on. The baseline noise, so to speak, is what has been identified as end plate noise. The end plate is where the final tip of the motor nerve attaches to the muscle fiber. There remains controversy over the actual origin of SEA with identification of intra-fusal and extra-fusal origins. This pertains to the spindle which is the sensory organ in the muscle as a possible source of the SEA. Generally speaking, the extra-fusal origin is accepted meaning that the end plate noise is generated from the normal muscle fibers. The second element is an end plate spike. The amplitude of the end plate spike is thought to be adequate to cause contraction of muscle fiber which the end plate noise is thought to be inadequate to do so. Other types of action potentials including even fibrillation potentials have been reported.

(14) Motor unit Potentials

<https://youtube.com/shorts/X8KRIg4o0ug?feature=share>

<https://www.dropbox.com/s/azejedxvegbr3z7/MUPs%20%28Motor%20Unit%20Potentials%29.mp4?dl=0>

 A significant type of action potential is a MUP, that is a Motor Unit Potential. Although I have recorded EMG signals for years, it was just recently that I had the opportunity to have an EMG expert identify an action potential that I had mistakenly thought might be a fibrillation potential. This is a key finding in that it had never been reported either in trigger point literature or in any description of chronic muscle spasm. The presence of trains of MUPs seems to be present in more severe chronic muscle spasm. These action potentials represent activation of a larger muscle fiber and presumed contraction. Constant contraction of larger muscle fibers that can be activated by an MUP help us understand how the muscle is kept in a state of constant spasm. This finding also ties into the theory that I had proposed as the Ischemic Model of Chronic Muscle Spasm as prolonged ischemia is likely to lead to membrane instability and spontaneous depolarization.

<https://youtube.com/shorts/O5AX2QRgdxk?feature=share>

<https://www.dropbox.com/s/prwklfogbn72wtd/In%20normal%20muscle%20MUPs%20are%20activated%20by%20voluntary%20activity..mp4?dl=0>

(15) In normal muscle MUPs are activated by voluntary activity.

<https://youtube.com/shorts/szotLRbofpI?feature=share>

<https://www.dropbox.com/s/mmrinnaetuslghr/Full%20Suppression%20of%20SEA.mp4?dl=0>

(16) Full suppression of SEA.

This is what you see (16) after injection with virtually all of the endplate noise and other action potentials suppressed. It is similar to what you see in normal muscle at rest, essentially a flat line.

<https://www.dropbox.com/s/zjvj798lqlluvdt/Suppressed%20SEA%20%26%20intermittent%20voluntary%20action.mp4?dl=0>

(17) Suppressed SEA with intermittent voluntary contractions increasing intensity to show that the muscle was still capable of contraction but no MUPs were activated.

<https://www.youtube.com/watch?v=bQrhNlOjOvw>

<https://www.dropbox.com/s/f1an57xppvda9qj/20230502_172801_573291090469011.mp4?dl=0>

(18) Resolution of SEA with injection. This next tracing shows the rapidity with which the injection resolves the SEA.

I want to go over some of the outcome data that I had compiled. This is the entire data set of the patient survey. (19) I personally have treated over 200 patients and injected over 30 different muscles. I did a survey of the last 100 or so patients and the data was compiled and statistically significance to the p < 0.01 level was attained. This slide is way too busy but the statistical findings were positive. (20) Also demonstrated was that the length of time the muscle had been in chronic spasm did not affect the success of the outcome. Often patients had chronic spasm for 1 to 5 years but some had spasm for decades and yet had successful outcomes. What is most surprising is that in all but a few cases only one injection was required. The same muscle was never injected twice as that was never needed. Additional injection sessions were for other muscles that could not be injected with the limited dose provided for one session. The Hierarchy of Pain dictated that patients with chronic pain and chronic spasm may find another source and site of pain to be treated. Generally, I would have them wait two weeks before another injection to make sure any original site discomfort had resolved and that the second site did not also resolve with normalization of gait or the like.

In a paper published last year “Chronic Muscle Spasm Induced Chronic Pain Treated with the CMECD® Procedure” in the International Journal of Physical Medicine and Rehabilitation, I included statements of patients that had been sent to my office detailing how the treatment had help them. This was a bit unusual in a scientific paper but I believed that it was required for what I called the believability of the results. I recommend you take a look at it. It is open access and no charge to read.

I did succeed in publishing a book (21) last year entitled Chronic Muscle Spasm and Pain: Discoveries in the Etiology, Identification and Treatment of Chronic Muscle Spasm and Resultant Chronic Pain. It is available online, paper, or hard copy. I receive no royalties to keep the cost down. The book is both a chronology of my 15-year clinical efforts and a do it yourself manual for the procedure.

After a little experience the procedure does not take much time and can be worked into normal patient hours. When I had a new patient referred to me, I allowed one hour for review of scans such as MRIs, examination of the patient, full explanation of the procedure and explanation of any questions from the consent form, injection of the patient and assessing the results by having the patient the move whatever hurt in the first place. For patients in your own practice, well known to you and having trust in you, much less time would be needed.

Having raised the issue of MRIs, I need to make clear that I never try to view the actual MRI scans as I am not an expert and it is not a good idea to question the official radiological interpretation. However, I do ask for the MRI reports when they are available. But as I tell my patients I only read the adjectives and not the nouns. Words like mild and moderate when used in lumbar MRIs do not normally indicate a source for the chronic pain or sciatica. That would indicate that there is a reasonable chance that injecting an identifiably spastic muscle may resolve the chronic pain or radiculopathy. Reports that state severe or critical would suggest injection may not appropriate.

What remains to be said is why consider undertaking this treatment rather than sending the patient off to a pain management physician. To be clear the pain management physician will have no procedure more successful than this one if chronic muscle spasm is the cause of the pain. Many times, all that is done is a controlled use of opioid medications. None of the patients I treated were given any pain medications and with treatment a significant percentage of them got off opioids or all pain medications. (22) However, the most important reason to undertake learning and use of this procedure is the tremendous satisfaction of taking a patient out of chronic pain. A patient you will likely be seeing again and again with recurrent satisfaction and their gratitude. Not much is gratifying in medicine today and this is the one of the single exceptions.

In closing, I just want to add that this may not be the best final treatment for chronic pain from chronic muscle spasm, but it is here and available. The understanding of the ischemic model of chronic muscle spasm may generate further insights and lead to new or improved treatments.

Thank you for your attention.

New findings

In areas that had been recently treated, voluntary activity increased the overall SEA but no MUPs were seen. In areas that were not recently treated, voluntary activity gave rise to MUPs. Treatment with Lidocaine alone also prevented the appearance of MUPs with voluntary activity. Areas of muscle previously treated with the lidocaine/phenoxybenzamine/dexamethasone combination also did not generate MUPs with voluntary activity.

[https://youtube.com/shorts/O5AX2QRgdxk?feature=share](https://youtube.com/shorts/O5AX2QRgdxk?feature=share" \t "_blank)

pre treatment with Lidocaine in area not recently treated with voluntary activity gives rise to MUPs.

 <https://youtube.com/shorts/2VvK3PC_tk8?feature=share>

Post treatment with lidocaine with voluntary activity and no MUPs are seen.

[https://youtube.com/shorts/Xayd-w17fX0?feature=share](https://youtube.com/shorts/Xayd-w17fX0?feature=share" \t "_blank)

Previously treated muscle with voluntary activity and no MUPs