

Case Report

Ultrasound Guided Trigger Point Injections in Myofascial Pain Syndrome

Shiva Prasad¹, Vijay², Gururaj Bangari³
Priyanka Patil⁴, Spurti N Sagar⁵

Abstract

Trigger points as a cause of musculoskeletal or myofascial pain syndrome is well documented. Trigger points (Tr Ps) are tender and hypersensitive nodules seen in skeletal muscles which develop as a result of sudden or repetitive trauma to the muscles. They cause contractile state of a muscle with local or radiating pain. Active trigger points cause intense pain with limitation of movements of the muscles. The treatment involves deactivating the trigger points, usually done by various methods. Most common practice is myotherapy which involves deep tissue massage which is painful and time consuming. Dry needling and needling with anaesthetic injection have been successfully used by many. Recently, ultrasound guidance is used to locate the trigger points and to accurately place the needle in to them to deactivate, thus preventing complications of blind procedures.

Key words: Ultrasound, trigger point, needling, myofascial pain.

Introduction:

Myofascial pain syndromes are known to be secondary to active trigger points (Tr Ps) in skeletal muscles. Most common form of deactivation Tr Ps has been deep tissue massage, which is painful and time consuming. Tr P dry needling or needling with local anaesthetic injection is being used as a successful alternative. Blind needling has few complications, like wrongly placed needles, haematoma and pneumothorax.

High frequency transducers have helped in successful localisation of trigger points. Present case report is to identify, prove and characterise trigger points in ultrasound and pave the way for understanding them and utilise the knowledge for pain relief.

Authors' affiliation:

¹ MBBS, MD.

² MBBS, HV, MD, DNB.

³ MBBS, DNB.

⁴ MBBS, MD.

⁵ MBBS, MD.

Department of Radiology and imaging sciences, Apollo BGS Hospitals, Mysore

Cite as:

Shiva Prasad, Vijay, Gururaj Bangari, Priyanka Patil, Spurti N Sagar, Ultrasound Guided Trigger Point Injections in Myofascial Pain Syndrome. IJPMR, September 2015; Vol 26(3):82-4

Correspondence:

Shiva Prasad, Department of Radiology and imaging sciences, Apollo BGS Hospitals, Mysore – 570023, Phone: 0821 2466047, 08212466048, E-mail:pradski@gmail.com, Mobile: 9972466006, Received on 16/11/2014, Accepted on, 11/12/2015

Case Report:

A 44-year-old man presented with generalised neck and shoulder pain for more than two years. The patient has had degenerative changes in the spine with no obvious disc herniation or nerve root compression. Patient was diagnosed to have repetitive stress injury (RSI) from his work. Musculoskeletal and sports medicine specialist had found multiple trigger points and had advised trigger point therapy (deep tissue massage or myotherapy). He had undergone regular myotherapy and had intermittent relief with recurrence. Finally ultrasound guided needling was suggested.

Patient was taken up for ultrasound guided trigger point injection. Patient was examined and individual muscles were palpated to locate trigger points eliciting tenderness, which are known to occur in specific locations in each muscle. Trigger points are extremely painful on pressure. Ultrasound is used to locate the point over the palpated nodule. The skin mark was done from a needle cap. After sterile preparation, the nodule was palpated and held between two fingers and needle was inserted with ultrasound guidance. Colour Doppler was used to rule out any vascular interposition. Needle was progressed till there was twitch response and patient felt pain. Patient's feedback in terms of altered pain sensation and referral pain confirmed accurate placement of the needle (Fig 1). Trigger point had unusual characteristic feel while being entered. Needle was seen to glide on the point and slip. While being pierced, there was a

feeling of giving in after little pressure, which felt like it had a well formed capsule. Once confirmed, needle was used to mechanically disrupt the nodule in multiple points. Ultrasound monitoring was also used to avoid further unwanted penetration of the needle into deeper structure (Philips HD 11 XE Ultrasound system, Linear probe 12 – 3 MHz, Needle.60 X 25mm 23 G).

Three types of trigger points were noticed in this report. The first one was an ill defined hyperechoic nodule, which was most elusive (Fig 2). The second type was a well defined hypoechoic nodule with a thin hyperechoic wall (Fig 3). Third was well-defined hypoechoic to anechoic nodule with a thin hyperechoic wall and subtle acoustic enhancement. It also showed a tiny central hyper echoic ring or linear dot (Fig 4). However we feel further studies are needed to confirm our findings. The smallest Tr P we could locate on ultrasound was 1.6 mm and the largest was 4mm.

At the end of the procedure 1ml of lignocaine was injected and needle was withdrawn. Soon after the procedure, there was immediate relief of pain, with release of stiffness in that particular muscle and improved range of movements.

Patient was asked to stretch that particular muscle after the procedure regularly. Other muscles were treated in the same way. Post procedure no complications were seen.

Discussion :

Trigger points as the cause of musculoskeletal and myofascial pain syndrome have been well established by Trevell and Simons¹. Trigger points form as a result of acute or chronic trauma to skeletal muscles and are known to form in specific locations in all the muscles¹. Cause of formation of TrP is still unknown. Biochemistry of the contents studied by Shah *et al*² have showed pain causing chemicals in the Tr Ps. Active and latent form of Tr Ps are described, where active Tr Ps cause local pain and taut bands in a muscle with shortening. Active Tr Ps are painful on compression and cause local and radiating pain.

The treatment options involve deactivating the active Tr Ps. Deactivation of Tr Ps are done by various methods which involve stretch and spray, deep tissue massage, soft tissue mobilisation, dry needling and injection therapy among others. Trigger point injection has been described as the most effective treatment by Alvarez *et al*³.

We adopted dry needling^{4,5}, injection therapy⁶ and

a combination of both methods for deactivating TrPs. Dry needling involves insertion of needle into the Tr P and puncture in multiple locations to mechanically disrupt the point³. Injection therapy involves injection of a local anaesthetic in to the Tr P to get an effective pain relief.

Blind needling has few complications, like accidental syncope, skin infection, haematoma and pneumothorax⁷.

Trigger point injections have been proven to be effective in deactivating them, thereby relieving the pain. Ultrasound guidance^{8,9} has been used recently to locate them for advancing the needles. Accurate placement and guided puncture of the points have helped in eliminating complications of blind needling. We are of the opinion that prior knowledge of the trigger points in muscles and palpation are important for localising them on ultrasound. Further studies are needed with musculoskeletal higher frequency transducers to confirm our findings.

Though blind techniques are quite safe and using expensive ultrasound machine may not be feasible in all the cases. Further studies are needed to identify quick and easily for the inaccessible Tr Ps.

Post procedure follow-up had shown the trigger point to be smaller in size with heterogeneous echotexture break in the wall of the trigger point, in the initial days. In the long duration trigger point sites did not show any problems. However looking for the passive trigger point would be difficult without tenderness.

Finally we would like to confirm that the study has helped in proving, identifying and characterising the Tr P in the myofascial pain syndrome. Further studies with high definition imaging probes may be needed to study the Tr Ps and ultrasound does not hold superior all the time over the blind dry needling, as they are cheaper and less time consuming in the general therapy other than the inaccessible areas.

Conclusions:

Ultrasound guided needling and injections have been used recently in treating trigger points. This has helped in accurate placement of needles with real time visualisation of the procedure. Complications involved in blind procedures have been eliminated. Significant pain relief is seen after the procedure without post procedure complications. Prior knowledge of the trigger points in specific muscles is of utmost importance in locating them on ultrasound. The use of ultrasound guided localisation definitely reduces the complications



Fig 1: Needle Tip

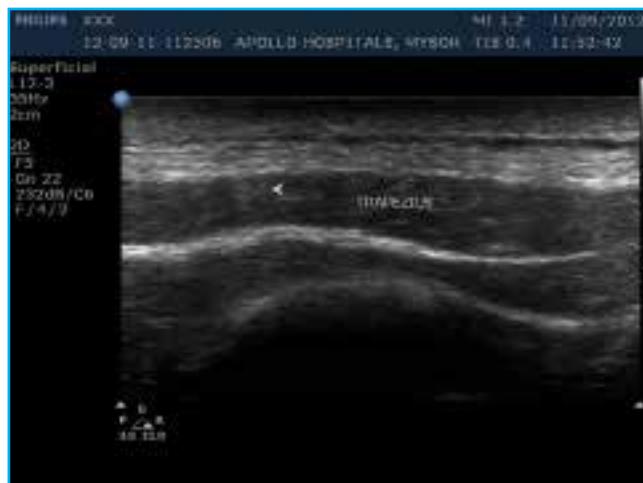


Fig 2: Hyperechoic Nodule



Fig 3: Hypoechoic Nodule



Fig 4: Central Dot

associated with needling and possibly enhances the efficacy of dry needling. Ultrasound guided needling helps in cutting short the time in deactivation of the trigger point than manual therapies in inaccessible areas. Manual therapies are cheaper and less time consuming for the general therapy.

Further and larger studies are needed to help in imaging the trigger points on ultrasound.

References :

1. Tavell JG, Simons DG. Myofascial pain and dysfunction: The Trigger Point Manual. Philadelphia PA: Lippincott Williams & Wilkins, 1983.
2. Shah P, Elizabeth A, Gilliams BA. Uncovering the biochemical milieu of myofascial trigger points using in vivo microdialysis: an application of muscle pain concepts to myofascial pain syndrome. *Bodywork and Movement Therapies* 2008; **12**: 371–84.
3. Alvarez DJ, Pamela G, Rockwell, University of Michigan Medical School, Ann Arbor, Michigan. *Am Fam Physician* 2002; **65**: 653-1.
4. Bubnov RV. The use of trigger point “dry” needling under ultrasound guidance for the treatment of myofascial pain (technological innovation and literature review). *Liksparva* 2010 ; **6**: 56-64.
5. Lewit K: The needle effect in the relief of myofascial pain. *Pain* 1979; **6**:83-90.
6. Hong CZ. Lidocaine injection versus dry needling to myofascial trigger point. The importance of the local twitch response. *Am J Phys Med Rehabil* 1994; **73**:256–63.
7. Kenneth P, Sharma K, Botwin: Ultrasound-guided trigger point injections in the cervicothoracic musculature: a new and unreported technique. *Pain Physician* 2008; **6**:885-9.
8. Niraj G, Collet BJ, Bone M. Ultrasound-guided trigger point injection: first description of changes visible on ultrasound scanning in the muscle containing the trigger point. *Br J Anaesth* 2011; **107** : 474-5.