The Confusion Between Infraspinatus Radiating Pain And C5-C6 Radiculopathy: A Case Report

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Abstract: Objectives of the Study: 1- To establish how infraspinatus radiating pain and C5-C6 radiculopathy differ. 2- To summarise the comparable symptoms and signs of C5-C6 radiculopathy and Infraspinatus radiating pain. Case Description: A male patient aged 38 complained of numbness, neck pain and pain moving to his left arm which began two years ago. As more symptoms and signs emerged, the physician advised that he should undergo surgery. The patient underwent surgery and was able to return to work. However, after a period of four months, the radiating left-arm pain symptoms returned. Following this, neck pain became more frequent, and ultimately resulted in continuous pain. Following this, he underwent a complete evaluation when he visited the physiotherapy clinic. The results did not reveal the origin of the pain and numbness as the cervical spine. He was then given the following treatment: stretching exercise for the infraspinatus muscle, myofascial release technique of the trigger points and Kinesio detoning taping. The patient experienced an improvement subsequent to this treatment and the symptoms began to recede. By conducting a comprehensive evaluation for the shoulder and the cervical, we detected the difference between C5-C6 radiculopathy for the cervical spine and the shoulder girdle infraspinatus trigger points. Conclusion: Subsequent to the clinical examination in this case, no clinical evidence was found that the origin of the numbness and pain was due to nerve root compression or disc bulge. The infraspinatus muscle referral zone has considerable similarity with that of the C5-C6 dermatomes. Consequently, this shows that differential diagnosis is significant in establishing the origin of the symptoms experienced by the patient.

1. INTRODUCTION
A male patient, aged 38, contacted the physical therapy department four months Post Anterior Cervical Discectomy and Fusion (ACDF) to report that the recurrence of the symptoms at the same rate as before the surgery. Generally, several medical conditions can cause neck and shoulder pain which spreads to the arm[1]. Such conditions include both mechanical and non-mechanical pain which emanates from musculoskeletal structures in the area of the cervical spine or the shoulder [2], [3]. Neck pain which spreads to the arm can be caused by nerve root compression which can also cause numbness in the dermatome of the specific nerve root[4]. Cervical radiculopathy may be accompanied by sensory and/or motor disturbances. Despite the fact that radiculopathy can be caused by several problems such as cervical spondylosis, acute disc herniation and foraminal narrowing, all of these can result in irritation and compression of a cervical nerve root[5]. The procedure of anterior cervical discectomy and fusion, which has been used for around half a century, is a type of surgery which is performed on patients having neck and arm pain where conservative treatment has failed. It is also used for various other symptoms such as radiculopathy and myelopathy[6]. It is also useful to be aware that trigger points in muscles can induce pain. Such trigger points consist of hypersensitive spots within taut bands of skeletal muscles; these cause pain on stimulation as well as evoking a referred pain [7]. Simons et al. (1999) claim that active trigger points within the Infraspinatus muscle have a tendency to induce both referred and local pain in the area of the shoulder as well as spreading to the lateral and frontal side of the arm and the hand. It is regarded that palpation clinical system of diagnosis of trigger points is dependable. It has been demonstrated by past studies that qualified physical therapists have the ability to detect trigger points reliably by means of palpation and by treating the condition by various types of methods and modalities[8], [9]. Physical therapy treatment of trigger points is inclusive of the following: stretching exercises, manual techniques, shock wave therapy and dry needling [10], [11].

2. Case Description:
This case concerns a male patient aged 38 whose profession is dentistry. This requires him to work for a considerable time in an unsatisfactory seating position. He complained of pain when he bent his neck forward, as well as complaining of stiffness of the neck, numbness and also sporadic radiating pain in his left hand and arm. During a two-year period of time, his symptoms gradually deteriorated and became continuous, leading to weakness in his hand grip and shoulder girdle muscles. As the increase in his symptoms resulted in continuous pain 9/10 (VAS Figure 1) which had an impact upon his “Activities of Daily Living” (ADL), he consulted an orthopaedic surgeon. It was discovered that the patient’s medical history was normal and that there were no previous issues within the musculoskeletal system.

Figure 1: Visual Analogy Scale (VAS)
A C5C6 bulge was detected by the MRI as well as bilateral foraminal stenosis which was, to a greater extent, in his left side (figures 2,3). The physician advised him to undergo surgery and an Anterior Cervical Discectomy and Fusion (ACDF) was undertaken.

The patient experienced an improvement immediately following the surgery and the symptoms started to recede slowly. Nevertheless, four months after this surgery, the symptoms returned while he was playing with his children. The numbness and pain increased (6/10(VAS) and it again became continuous. Following this, he visited his doctor who referred him to the Rehabilitation Department. On his visit to the physiotherapy clinic, it became apparent that his neck was very stiff and he was afraid to move it. Following a physiotherapy evaluation, it was discovered that he had: a normal Active Range of Motion (AROM) for the cervical spine and left shoulder joint without any limitation in movements; a negative upper limb neural tension test; a normal manual muscle test (MMT) for and shoulder and neck muscles and that his reflexes and sensation were intact. Tightness in the infraspinatus muscle was detected by palpation, and ischemic pressure upon the infraspinatus muscle trigger points caused the symptom of numbness and pain in his left arm. We managed this patient as a muscular dysfunction case and treated him by a trigger point by the myofascial release method. We also gave him an infraspinatus muscle stretching exercise and a Kinesio detoning taping in order to reduce tightness within the infraspinatus muscle. The patient experienced improvement subsequent to this session and his symptoms began to recede. He was given guidance on certain home stretching exercises and adjusted his posture according to how he felt comfortable during his daily activity. After we conducted a comprehensive evaluation of the cervical, shoulder and thoracic areas, we were able to differentiate between the cervical spine C5C6 radiculopathy and the infraspinatus trigger points in the left shoulder.

3. Brief Review

3.1 Dermatomes of C5 and C6
In neurology clinics, it is a common occurrence for C5 and C6 human anatomical territories to be discovered to be compromised; this principally occurs subsequent to traumas. Nevertheless, there is much contention regarding C5 and C6 human dermatomes. C5 represents the entire lateral aspect of the arm, just proximally to the elbow joint; whereas C6 human dermatomes will probably be on the lateral aspect of the forearm, one, two and three fingers[12]. (Figure 5).

3.2 Radiculopathy Pain
Cervical radiculopathy is defined as a sensorimotor deficit syndrome and/or pain which is the result of the compression of a cervical nerve root [13], [14]. Such compression can be caused by spondylosis, disc herniation, trauma, instability and even on rare occasions, tumours There is a wide range of patient presentations. These can vary from tingling and/or numbness in the upper extremity, pain, electrical type pains, or in some circumstances, weakness [15].

3.3 Infraspinatus Muscle
Infraspinatus, which is a rotator cuff muscle connects with teres minor at musculotendinous junctions. It subsequently fuses with the supraspinatus approximately proximal to the insertion site; following this, they fuse together with the subscapularis across the bicipital groove into the greater tuberosity of the humerus[16]. In the course of an overhead throwing motion, the infraspinatus muscle causes an approximation force to withstand distraction[17]. This muscle also supplies the external-rotation force. This plays a critical role in providing dynamic stability and producing external-rotation torque at the shoulder joint[18]. The Infraspinatus muscle, which is triangular and thick, occupies a crucial position in supplying dynamic stability, thereby causing external rotation torque at the shoulder joint[19]. Furthermore, it occupies the principal part of the infraspinatus fossa and helps the arm’s external rotation, together with the stabilisation of the humerus head when the arm moves.
3.4 Referral Zone of Infraspinatus Trigger Points
We can describe trigger points as delicately-tender areas within distinct hardened muscle bands which, together with other symptoms, cause both referred and local pain. It is presupposed by the integrated trigger points hypothesis that motor endplates discharge excessive acetylcholine during myofascial pain. This is pathologically evidenced by the presence of sarcomere shortening[20]. Both referred and local pain in the area of the shoulder, spreading to the lateral and frontal side of the arms, (Figure 5) can be caused by trigger points in the infraspinatus muscle. Furthermore, active trigger points in the infraspinatus muscle have the capacity to produce changes in the normal muscle activation pattern, thereby leading to motor dysfunction [21].

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Figure 5: Referral Zone of Infraspinatus Trigger Points

3.5 Physical Therapy for Trigger Points
Myofascial pain, induced by trigger points, frequently results in muscle pain. Medical literature is showing a growing acceptance of the function of trigger points in musculoskeletal pain. Moreover, palpation continues to be regarded as the only dependable clinical system of diagnosing trigger points. It has been demonstrated by past studies that qualified physical therapists have the ability to provide a dependable detection of trigger points by palpation and apply many methods to treat this condition [22]. Physical therapy treatment of trigger points is inclusive of the following: stretching exercises, manual techniques, shock wave therapy and dry needling which are able to deactivate the trigger points. If and when it is suitable to do so, it is possible to merge trigger point deactivation with active exercises, ergonomic advice, relaxation and postural correction [23].

4. Conclusion:
We discovered, in this case, that subsequent to clinical evaluation, no clinical evidence emerged regarding nerve root compression. Furthermore, past studies imply that the infraspinatus muscle referral zone bears a considerable similarity to C5 and C6 dermatomes, which may result in a confused diagnosis of patients having radiating pain to arm. A complete evaluation ought to be conducted and there should be no dependence upon the image results. Therefore, it is essential to undertake a differential diagnosis in order to determine the origin of the pain.


