

Rare Complications - Twitching of the Latissimus Dorsi Muscle after Thoracotomy for Esophageal Cancer: A Case Report

Zhang L¹, Zuo X¹, Lu G², Jia Z^{1*} and Wang Y³

¹Department of Rehabilitation Medicine, Chinese PLA General Hospital, Beijing, China

²Department of pain, Chinese PLA General Hospital, Beijing, China

³Department of ultrasound, Chinese PLA General Hospital, Beijing, China

*Corresponding author:

Zishan Jia,
Department of Rehabilitation Medicine,
Chinese PLA General Hospital,
Beijing, China,
Tel: 8615210889919;
Fax: 861066939391,
Email: JZS1963@163.com;
zhangln301@126.com

Received: 14 Oct 2020

Accepted: 27 Oct 2020

Published: 29 Oct 2020

Copyright:

©2020 Jia Z. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and build upon your work non-commercially.

Citation:

Jia Z. Rare Complications - Twitching of the Latissimus Dorsi Muscle after Thoracotomy for Esophageal Cancer: A Case Report. Japanese Journal of Gastroenterology and Hepatology. 2020; V4(14): 1-3.

Keywords:

Thoracotomy; Esophageal cancer; Muscle twitching; Botulinum toxin

1. Abstract

Complication of twitching of the latissimus dorsi muscle after thoracotomy for esophageal cancer is rare. We represent our experience treating twitching and pain of the latissimus dorsi muscle with ultrasound-guided botulinum injection. The symptoms were relieved for three months.

2. Introduction

The latissimus dorsi muscle is located in the lower thoracodorsal area and lumbar region, and is the largest and widest flat muscle in the human body. This muscle is responsible for adduction and internal rotation of the shoulder joint, and is innervated by the cervical nerves 6 through 8, which form the thoracodorsal nerve, an important branch of the brachial plexus [1]. The thoracodorsal nerve can be injured during thoracotomy procedure. Subsequent twitching and pain of the ipsilateral latissimus dorsi muscle is known to be a rare complication of thoracotomy. Postoperative involuntary muscle twitching is more likely to occur after thoracotomy procedures for pneumonia, lung cancer, or breast cancer.

The aim is to present the authors' experience of treating the twitching and pain of latissimus dorsi muscle with ultrasound-guided botulinum toxin injection.

3. Case Report

A 53-year-old man was admitted with a complaint of pain and twitching in the sternocostal aspect of the left latissimus dorsi muscle for 5 years after undergoing thoracotomy for esophageal cancer. The mild pain and irregular twitching presented insidiously adjacent to the healed operative scar. Oral analgesic drugs were unsuccessful at controlling the symptoms (Figure 1). After 2 years, the pain and twitching became more frequent and persistent, even interfering with the patient's sleep. Anti-spasmodic and anti-epileptic drugs were prescribed and proved ineffectual. Intercostal, dorsal root ganglion and dorsal spinal nerve blocks were also attempted without success. The problem continued to worsen over time.

Finally, the patient was referred for admission. He had no personal or family history of neurologic diseases. On physical examination, there was a palpable mass directly in the healed scar of the left latissimus dorsi muscle. Ultrasound examination revealed a 0.7-cm×0.4-cm hard hypoechoic nodule with clear boundaries. During the examination, it was noted that the twitching centered on a knot in the healed incision scar, and could be suppressed by manual compression of the nodule. The Visual Analogue Scale (VAS) score for pain was 8 out of a maximum of 10.



Figure 1: Spasm of the latissimus dorsi muscle.

Due to severe pain, the patient refused to undergo needle electromyography (EMG). The blood test and lung X-ray were normal. Neurological examination showed normal. Blood test and urine analysis results were normal. The brain MRI was normal. There were no signs of tumor recurrence.

The ultrasound examination showed a 0.7×0.4-cm hypoechoic hard nodule with clear boundaries, which was located in the primary incision in the latissimus dorsi muscle in the left chest wall. CDFI showed no blood flow signal. After obtaining consent, ultrasound-guided injection of botulinum toxin type A (BTA) (BOTOX; Allergan, Inc) was performed. Since the involuntary contraction were irritated by the nodule, 20 units of BTA were injected directly into the nodule, 20 units at two points around the nodule, and 20 units each at two points in the belly of the latissimus dorsi muscle. In total, 100 units of BTA were injected.

One week after the BTA injections, the pain was markedly relieved, with a VAS score of 3. However, the frequency of involuntary contractions of the latissimus dorsi muscle had not reduced significantly. One month later, both the twitching and pain of the latissimus dorsi muscle had almost ceased with only slight twitching still present.

There was neither weakness of the latissimus dorsi muscle nor side effects of the botulinum toxin. His sleep cycle had returned to normal. The patient was satisfied with the effects of treatment. However, three months later, the twitching and pain gradually reappeared in the same area.

Written informed consent for this case report has been obtained from the patient.

4. Discussion

The thoracodorsal nerve can be injured during thoracotomy, and a few cases of twitching confined to the latissimus dorsi muscle after thoracotomy have been reported. In the first case, a 66-year-old man with primary lung cancer suffered from severe pain and involuntary twitch in the left latissimus dorsi muscle developing one year after resection of the upper lobe of the left lung. The involuntary spasms were located in the muscles of the back, neighboring the surgical scar and twitching intermittently in an upward direction, and the intensity of these symptoms gradually increased over time. The pain and involuntary movements were temporarily controlled by blockage of either the thoracodorsal nerve or the brachial plexus. His symptoms resolved completely after resection of the nerve [2]. In the second case, a 42-year-old woman underwent a thoracotomy for severe pneumonia. Two months later, the left latissimus dorsi muscle, adjacent to the surgical scar, developed frequent involuntary muscle contractions. The symptoms were relieved completely by an injection of botulinum toxin type A into the muscle [3]. In the third case, a 60-year-old man with a necrotic mass that occluded the upper right bronchus received upper lobectomy. One month later, myoclonus of the latissimus dorsi muscle appeared, although no neurogenic signs were demonstrated on EMG. The symptoms were relieved by botulinum toxin injection, and then recurred later. The myoclonus was finally controlled by sectioning the nerve within the scar [4]. In the fourth case, a 43-year-old man suffered chest wall pain and involuntary contractions of the latissimus dorsi muscle three months after video-assisted thoracoscopic lung resection. He remained unresponsive to therapeutic interventions, including oral benzodiazepines, nerve blockage, and botulinum toxin injection. However, his symptoms gradually resolved spontaneously 18 months after the procedure [5]. In the fifth case, a 46-year-old woman suffered continued twitching of the latissimus dorsi muscle after breast tumor with conservation therapy and reconstruction with a latissimus dorsi mini flap. The symptom recurred despite being controlled briefly after several treatments of local BTX-A percutaneous injection. The twitching finally disappeared after surgical division of the thoracodorsal nerve [6].

In the patient described in this case study, there was a firm, well-circumscribed nodule in the healed surgical scar of the latissimus dorsi muscle. The fact that the twitching emanated from the nodule and could be suppressed by pressing the nodule seemed to indicate that the one of branches of the thoracodorsal nerve had been cut and

regenerated into a small neuroma. The neuro mairritated the latissimus dorsi muscle causing involuntary, painful contractions that were thought to originate in the damaged thoracodorsal nerve, be transmitted to CNS and then be transmitted back to the thoracodorsal nerve. Perhaps it was also a combination of central and peripheral mechanisms which triggered the involuntary muscle contractions.

Botulinum toxin A (BTX) or Botox is a euro toxin produced by the organism *Clostridium botulinum* [7]. It reduces muscle spasticity by inhibiting the release of acetylcholine from axon endings at the neuromuscular junction. It has been used effectively since the 1980's for the treatment of many diseases such as dystonia, spasticity, autonomic disorders, hemifacial spasm, and post-stroke limb spasticity, as well as others pastic conditions [8, 9]. Recently, it was reported to be effective in the treatment of involuntary repetitive muscle twitching. Specifically, twitching of the latissimus dorsi muscle has successfully been ameliorated by local injection of BTX-A. Many physicians also report that pain reduction when BTX-A is injected occurs prior to the relief of spasticity and that the BTX-A has an antinociceptive effect that is separate from the antispasmodic effect [10, 11]. BTX-A has been used with favorable results in the treatment of myofascial pain syndromes, as well as migraine and other types of headaches [12, 13]. It has been reported that the toxin acts by blocking substance P and glutamate release, creating an antinociceptive effect [14, 15]. It was also suggested that BTX-A blocks peripheral sensitization and indirectly reduces central sensitization [16]. It has been demonstrated previously that BTX-A inhibits migraine pain by acting on both peripheral and central mechanisms [17, 18]. That may also explain the pathophysiology of twitching of the latissimus dorsi muscle involving a mechanism of both peripheral and central sensitization.

5. Conclusion

The primary observation from this case report reveals that twitching and pain localized at the latissimus dorsi muscle resulting from posterolateral thoracotomy for esophageal cancer can be relieved by BTX-A injection. The span of time between surgery and the onset of twitching can be very short, and twitching may be a companied by severe pain. Injection of botulinum toxin Type A into the nodular scar tissue and the belly of the latissimus dorsi muscle provided a simple and effective treatment option.

References

1. Bartlett SP, May JW Jr, Yaremchuk MJ. The latissimus dorsi muscle: a fresh cadaver study of the primary neurovascular pedicle. *Plast Reconstr Surg*. 1981; 67: 631-6.
2. Kakinuma S, Sasabe F, Nogaki H, Negoro K, Morimatsu M. A case of painful involuntary contraction of the left latissimus dorsi muscle successfully treated with left thoracodorsal nerve resection. *Rinsho Shinkeigaku*. 1994; 34: 1018-20.
3. Chung SJ, Lee E, Lee MC. Myoclonus of the latissimus dorsi muscle

after thora- cotomy. *Mov Disord*. 2008; 23: 1949-50.

4. Carnero-Pardo C, Sanchez-Alvarez JC, Gomez-Camello A, Minguez-Castellanos A, Hernandez-Ramos FJ, Garcia-Gomez T et al. Myoclonus associated with thoracodorsal neuropathy. *Mov Disord*. 1998; 13: 971-2.
5. Aslam MI, Oey IF, Waller DA. Latissimus dorsi myoclonus after video assisted thoracoscopic lung volume reduction. *Ann Thorac Surg*. 2009; 88: 1360-2.
6. Huang DP, Ye XH, Xiang YQ, Zhang XH. Continued twitching of the latissimus dorsimini flap after breast conservation therapy: a case report. *World J Surg Oncol*. 2012; 10: 122.
7. Park ES, Rha DW, Yoo JK, Kim SM, Chang WH, Song SH. Short-term effects of combined serial casting and botulinum toxin injection for spastic equinus in ambulatory children with cerebral palsy. *Yonsei Med J*. 2010; 51: 579-584.
8. Laskawi R, Olthoff A. Botulinum toxin in otorhinolaryngology-an update. *HNO*. 2017; 65: 859-70.
9. Pirazzini M, Rossetto O, Eleopra R, Montecucco C. Botulinum Neurotoxins: Biology, Pharmacology, and Toxicology. *Pharmacol Rev*. 2017; 69: 200-235.
10. Aoki KR. Basic aspects of botulinum toxin: physiology and pharmacology of therapeutic botulinumneurotoxins. *CurrProbl Dermatol*. 2002; 30: 107-16.
11. K. Roger Aoki. Evidence for antinociceptive activity of botulinum toxin type A in pain management. *Headache*. 2003; 43: S9-S15.
12. Silberstein SD. Review of botulinum toxin type A and its clinical applications in migraine headache. *Expert Opin Pharmacother*. 2001; 2: 1649-54.
13. WP Cheshire, SW Abashian, JD Mann. Botulinum toxin in the treatment of myofascial pain syndrome. *Pain*. 1994; 59: 65-9.
14. Ishikawa H, Mitsui Y, Yoshitomi T, Mashimo K, Aoki S, Mukuno K et al. Presynaptic effects of botulinum toxin type A on the neuronally evoked response of albino and pigmented rabbit iris sphincter and dilator muscles. *Jpn J Ophthalmol*. 2000; 44: 106-109.
15. Deleu D, Hanssens Y, Worthing EA. Symptomatic and prophylactic treatment of migraine: a critical reappraisal. *ClinNeuropharmacol*. 1998; 21: 267-79.
16. Aoki KR. Evidence for Antinociceptive Activity of Botulinum Toxin Type A in Pain Management. *Headache*. 2003; 43: S9-15.
17. Cui M, Li Z, You S, Khanijou S, Aoki KR. Mechanisms of the antinociceptive effect of subcutaneous Botox inhibition of peripheral and central nociceptive processing. *NaunynSchmiedebergs Arch Pharmacol*. 2002; 365: R17.
18. Malick A, Burstein R. Peripheral and central sensitization during migraine. *FunctNeurol*. 2000; 15: 28-35.