

## Management of Tietze Syndrome: Acupuncture and Cupping as an Effective Treatment Approach: A Case Study

Jaya Satyal<sup>1</sup>, Shrestha Rakesh<sup>2</sup>, KC Pradeep<sup>1</sup>, Khatiwada Kashi<sup>1</sup>, Rouniyar Nabina<sup>3</sup>, Chandra Avinash<sup>4</sup>

<sup>1</sup>Central Ayurveda Hospital, Nardevi, Kathmandu, Nepal

<sup>2</sup>Department of Physiotherapy, Annapurna Neurological Institute & Allied Sciences, Maitighar, Kathmandu, Nepal

<sup>3</sup>Ayurveda Campus Teaching Hospital, Institute of Medicine, Tribhuvan University

<sup>4</sup>Department of Neurology, Annapurna Neurological Institute & Allied Sciences, Maitighar, Kathmandu, Nepal

### CORRESPONDENCE

Dr. Jaya Satyal  
Central Ayurveda Hospital,  
Nardevi, Kathmandu, Nepal  
Email: satyaldrjaya@gmail.com

### ARTICLE INFO

Article History

Submitted: 22 April, 2022

Accepted: 28 May, 2022

Published: 8 August, 2022

Source of support: None

Conflict of Interest: None

**Copyright :** ©The Author(S) 2022

This is an open access article under the Creative Commons Attribution license CC-BY 4.0



### ABSTRACT

Tietze syndrome is a rare inflammatory disorder characterized by chest pain at costochondral junction with an idiopathic etiology. A patient came to the Central Ayurved Hospital Nardevi with an excruciating pain since 5 months. Patient stated that the several medications were tried without any success. Patient was further assessed via radiologically and laboratory. Results were within normal limits. Hence, patient was given 12 sessions of acupuncture along with cupping as the means for pain management. Patient was initially assessed via VAS (Visual Analogue Scale) before the commencement of the treatment session. This case demonstrates that the acupuncture can be an effective treatment approach for the management of Tietze syndrome.

**Keywords:** *Acupuncture; Cupping Tietze; VAS.*

### INTRODUCTION

Tietze syndrome (also called costochondral junction syndrome or chondropathia tuberosa), is a rare and benign inflammatory condition characterized by chest pain and swelling at the costochondral junction. It's first described in 1921 by the German surgeon Alexander Tietze, as a non-suppurative, benign, painful superior chondrosternal joint swelling.<sup>1</sup> The exact etiology is unclear. Some studies have postulated multiple micro traumas to the anterior chest wall and psoriatic arthritis may trigger the development of Tietze syndrome. It is preceded by chronic, excessive coughing, vomiting, trauma, viral or bacterial infections, and surgery to the thoracic area. Most often associated with the cartilage of ribs two or three and unilateral in 70% of patients. It mainly involved sternoclavicular and xiphisternal joints. It is mainly inflammatory and may be part of a more comprehensive seronegative pathology.<sup>2</sup> For diagnosis, an electrocardiogram (ECG) and laboratory results are needed to rule out other causes but in

TZE, these are non-specific. Biopsy of the costal cartilage can lead to a more prompt diagnosis if obtained early in the disease progression. Ultrasound has proven to be the most effective modality as it can quickly demonstrate soft tissue swelling at the site of inflammation. Nuclear magnetic resonance (NMR), which accurately identifies alterations in the neighboring fat tissue and bone marrow due to inflammation. Elevated inflammatory markers such as ESR or CRP. Radiographs are typically read as normal, while computed tomography (CT) may show a slight focal swelling or mild sclerosing of the symptomatic joint.<sup>3</sup> The keystone treatment is conservative therapy and reassurance, first-line medical management is oral or topical anti-inflammatory and analgesic agents. If those do not provide significant relief, focused injection of local anesthetic, steroid, or both at the site of maximum swelling. Resection of cartilage in persistent severe cases. In the differential diagnosis of chest

pain, Tietze’s syndrome should always be considered. Acupuncture and cupping as an effective treatment modality for any type of pain. The purpose of this study was to see the effectiveness of acupuncture in pain management of Tietze syndrome and report the outcome.

### CASE REPORT

A 47 years old female presented to the OPD of Naradevi Ayurveda hospital with the complaint of severe sharp stabbing knife type of pain in her chest with mild swelling in costochondral junction, aggravated by coughing, movement of spine especially in extension position. She has the ongoing pain since last 5 months and diagnosed as Tietze syndrome via radiological and clinical features. Clinically, there was a tenderness over the involved cartilage and was exaggerated by effort as a result of increased thoracic movement. A small, firm, smooth mass may become palpable and visible in the involved costochondral junction. Radiologically there were enlargement and thickening of cartilage at the site of complaint with focal increased signal intensities of affected cartilage on both TSE T2 weighted and STIR/T2 fat saturated images. Patient had been undergoing treatment at various centers with differential diagnosis of costochondritis, ankylosing spondylitis and slipped rib syndrome. She underwent various interventional therapies like corticosteroid, painkillers, ultrasound guided glucocorticoids (prolotherapy). However, she was not getting better with those interventions and came to Naradevi for further intervention. She was given 12 sessions of Acupuncture along with cupping treatment; her improvement was evaluated using VAS scale.

Tietze is rare conditions and only over 100 cases with chest pain caused by this syndrome has been described by authors. A search for reports concerning this entity in the American literature reveals that Tietze’s syndrome has been discussed only twice; the first paper by Motulsky and Rohn in 1953.<sup>5</sup> and the second by Wehrmacher in 1955.<sup>6</sup> The scarcity of publications concerning this entity and the observation of two patients with Tietze’s syndrome in the past couple of years has prompted this report and also there has been only one study of acupuncture based management for Tietze syndrome by FokkeJonkman, 2015. Therefore, this case study will be the additional milestones in stating that acupuncture and cupping can augment the effective managements of such condition along with all other treatment possibilities.

#### Acupuncture Treatment and Acupoints selection

She received Acupuncture for twelve days. She received six treatments per week. Each Acupuncture treatment session lasted for 30 minutes. Patient was kept in supine position. Needles were inserted to 0.3 to 0.5cun horizontally and obliquely. After 15 minutes, lifting-thrusting, twirling and rotating manipulation was done for one minute at a frequency of 40-60/ min.

Stainless steel needles of 0.25\*25mm were used. Appropriate stimulation was applied in order to attain the ‘De qi’ sensation. The following acupoints were selected:

- Yutang(CV18) - at the anterior midline , level with the 3rd intercostal space.
- Zigong(CV19) - at the anterior midline , level with the 2nd intercostal space.
- Huagai (CV20) - at the anterior midline , level with the 1st intercostal space
- Xuanji(CV21) - on the midline of the manubrium of sternum .
- Taichong(LV3) – on the dorsum of the foot in the depression distal to the junction of the 1st and 2nd metatarsal bones.
- Danzhong(CV17) - on the midline of the sternum between the nipple , in the depression level with the 4th intercostal space.
- Aashi points- Tender site

After Acupuncture, plastic cupping were applied over the above-mentioned acupoints for 6-8 minutes. Outcome measure for this study was taken via Visual Analogue Scale (VAS) where initial assessment of her pain was at 10 (Unbearable pain) and there was a significant pain reduction on day 6 with VAS at 4 and was completely pain free at the end of 12th treatment sessions.

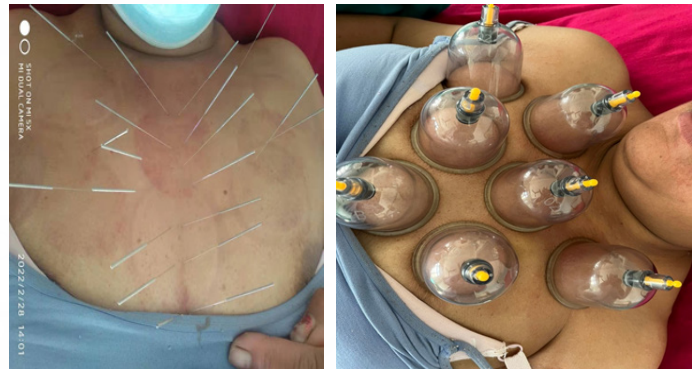


Figure 1: Acupuncture and cupping of the case

### DISCUSSION

Acupuncture and cupping is an important component of TCM. WHO has recommended Acupuncture for more than 100 diseases including Tietze syndrome.<sup>7</sup> When acupoints are fully activated, sensations of soreness, numbness, fullness, or heaviness called De qi are felt by both clinicians and patients.<sup>8</sup> In TCM, this is related to stagnation of Liver Qi and defined as Bi syndrome. In Bi syndrome, there is a mixed symptoms of wind-cold and damp. Bi in Chinese means obstruction which indicates blockage in circulation of Qi and blood which causes pain, numbness, tingling, swelling, feeling of heaviness or limited range of motion. Most of the acupoints chosen are from conception vessel as the points lie above underlined pathological part known as the local points. Yutang(CV18) , Zigong(CV19), Huagai(CV20) and Xuanji(CV20) all are

acupoints of conception vessel and are used to treat chest pain and chest discomfort. Danzhong(CV17), is also punctured to treat chest oppression. All above mentioned points are useful in relieving chest pain by clearing the heat. Previous study done by Tang et al on 2018 also used Danzhong(CV17) as a rule of acupoint and meridian selection in acupuncture – moxibustion for stable angina pectoris.<sup>10</sup> Taichong (LV3) is a distance point which is related to liver meridian and it let free flow of liver Qi and resolves liver Qi stagnation. A study done by Chunxiao Wu et al on 2014 found Acupuncture at LV3 can specifically activate or deactivate brain areas related to vision, movement, sensation, emotion, and analgesia and there is specific alterations in the anterior cingulate gyrus, thalamus, and cerebellar posterior lobe.<sup>9</sup> A previous study suggested that the anterior cingulate gyrus (BA32) participated in many complicated motor functions and pain reactions in the body. The thalamus is a relay station and is involved in sensory perception. A previous study showed that the thalamus is associated with the regulation of acute and chronic pain. After acupuncture with Deqi pain-activated brain areas were transformed into an inhibitory state, exerting an analgesic effect of acupuncture.<sup>12</sup> Acupoints are easily activated on the basis of their special composition of blood vessels, mast cells, and nerve fibers that mediate the acupuncture signals.<sup>8</sup> Prior study published in the American journal of Chinese medicine done by Teng Chen et al 2020 postulated the Molecular Mechanism action of acupoints. According to this study, In the spinal cord, Electroacupuncture(EA) can inhibit glial cell activation by down-regulating the chemokine CX3CL1 and increasing the anti-inflammatory cytokine interleukin-10 which inhibits P38 mitogen-activated protein kinase and extracellular signal-regulated kinase pathways, these are associated with microglial activation of the C-Jun N-terminal kinase signaling pathway and subsequent astrocyte activation. The inactivation of spinal microglia and astrocytes mediates the immediate and long-term analgesic effects of EA, respectively. A variety of pain-related substances released by glial cells such as the proinflammatory cytokines tumor necrosis factor  $\alpha$ , interleukin-1 $\beta$ , interleukin-6, and prostaglandins such as prostaglandins E2 can also be reduced. The descending pain modulation system in the brain, including the anterior cingulate cortex, the periaqueductal gray, and the rostral ventromedial medulla, plays an important role in EA analgesia. Multiple transmitters and modulators, including endogenous opioids, cholecystokinin octapeptide, 5-hydroxytryptamine, glutamate, noradrenalin, dopamine,  $\gamma$ -aminobutyric acid, acetylcholine, and orexin A, are involved in acupuncture analgesia.<sup>8</sup> Similarly prior study done by Xiao- Shu chai et al also found acupuncture therapy is safe, rapid acting, convenient and inexpensive in treatment of lung cancer chest pain.<sup>10</sup> Cupping is a traditional Chinese therapy that has been in use for more than 2000 years and is now practiced in numerous cultures. It is a treatment in which a cup is applied to the skin surface to create suction which

causes local congestion to prevent and treat disease. It works by creating negative pressure by consuming the air inside the cup with fire or other methods. It has an action of warming the meridians, invigorating qi and blood circulation, relieving blood stagnation, alleviating pain and swelling, dispelling damp and cold. There are various hypothesis regarding cupping. One theory accepted by several authors is that cupping increases the circulation surrounding the treated area, thus enabling toxins trapped deep in the soft tissue layers and release the dampness from our body.<sup>13</sup> Same study also determined cupping potential benefits in pain management particularly in musculo-skeletal conditions.

## CONCLUSION

There was a significant improvement on pain, range of movement and swelling seen in this case. Acupuncture and cupping are effective treatment modality for pain management if the first line of treatment fails. It also helps to avoid patient unnecessary anxiety, time and expenses. Thus, we can propose Acupuncture and cupping as an additional treatment options for Tietze Syndrome. However, there is still need of further study to prove its effectiveness as it is only a single case study.

## REFERENCES

1. Sawada K, Ihoriya H, Yamada T, Yumoto T, Tsukahara K, Osako T, Naito H, Nakao A. A patient presenting painful chest wall swelling: Tietze syndrome. *World Journal of Emergency Medicine*. 2019;10(2):122.
2. Rokicki W, Rokicki M, Rydel M. What do we know about Tietze's syndrome?. *Kardiochirurgia i Torakochirurgia Polska/Polish Journal of Thoracic and Cardiovascular Surgery*. 2018 Sep 24;15(3):180-2.
3. NORD. Rare Disease Database: Tietze Syndrome [Internet]. Available from: <https://rarediseases.org/rare-diseases/tietze-syndrome/>
4. Tietze, A.: *Uebereineeigenartige Haufung von Fallen mit Dystrophy der Rippenknorpel*, Berl. Win. Wchnschr. 58: 829-831, 1921.
5. Motulsky, A., and Rohn, R. J.: Tietze's syndrome: cause of chest pain and chest wall swelling, *J. A. M. A.* 152: 504-506, 1953.
6. Wehrmacher, W. H.: Significance of Tietze's syndrome in differential diagnosis of chest pain, *J. A. M. A.* 157: 505-507, 1955.
7. Joe. *Holistic Health Oxford*. 2022. Available from: <https://holistic-health.org.uk/world-health-organisation-recommends-acupuncture-100-conditions/>
8. Chen T, Zhang WW, Chu YX, Wang YQ. Acupuncture for

- pain management: molecular mechanisms of action. *The American journal of Chinese medicine*. 2020 May 15;48(04):793-811.
8. Chen T, Zhang WW, Chu YX, Wang YQ. Acupuncture for pain management: molecular mechanisms of action. *The American journal of Chinese medicine*. 2020 May 15;48(04):793-811.
  9. Wu C, Qu S, Zhang J, Chen J, Zhang S, Li Z, Chen J, Ouyang H, Huang Y, Tang C. Correlation between the effects of acupuncture at Taichong (LR3) and functional brain areas: a resting-state functional magnetic resonance imaging study using true versus sham acupuncture. *Evidence-Based Complementary and Alternative Medicine*. 2014 Jan 1;2014.
  10. Chai XS, Wu WY, Deng H, Zhou YS, Zhao YJ. Treatment of 24 cases of chest pain following lung cancer by balancing acupuncture therapy. *Journal of Acupuncture and Tuina Science*. 2008 Dec;6(6):363-5.
  11. Tang et al on 2018 also used Danzhong(CV17) as a rule of acupoint and meridian selection in acupuncture – moxibustion for stable angina pectoris.
  12. K. K. Hui, J. Liu, N. Makris et al., “Acupuncture modulates the limbic system and subcortical gray structures of the human brains: evidence from fMRI studies in normal subjects,” *Human Brain Mapping*, vol. 9, no. 1, pp. 13–25, 2000.
  13. Al-Shidhani A, Al-Mahrezi A. The role of cupping therapy in pain management: A literature review. *Pain Management-Practices, Novel Therapies and Bioactives*. 2020 Sep 25.
  14. Rozenfeld E, Kalichman L. New is the well-forgotten old: The use of dry cupping in musculoskeletal medicine. *Journal of bodywork and movement therapies*. 2016 Jan 1;20(1):173-8.