Role of Stellate ganglion block in post CABG sympathetically mediated chest pain

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Abstract

Acute chest pain is a common presentation in emergency. After clinical assessment undiagnosed chest pain can become a difficult problem. Sympathetically mediated chest pain is a rare presentation, as it is similar to that of secondary hyperalgesia in the intact skin surrounding an injury site. We are reporting a case of a 62 years old man who presented with atypical chest pain four months after coronary artery bypass grafting (CABG). On investigation no new change was noticed than previous evaluation. On chronic pain assessment he was having hyperalgesia to light touch in addition to the spontaneous chest pain. He was treated as a case of sympathetically mediated chest pain, pain modulators, analgesics and Stellate ganglion block. Patient responded dramatically to Stellate ganglion block and returned to work within two weeks time. This case illustrated the importance of early diagnosis of sympathetically mediated chest pain and role of Stellate ganglion block.

Introduction

Acute Chest Pain is a common reason for emergency hospital attendance and admission. Patients with chest pain that remains undiagnosed after clinical assessment, ECG and chest radiograph pose a particular problem. Most patients with undifferentiated chest pain do not have a coronary syndrome, whereas anxiety and psychological morbidity are common[1] and appear to be associated with impaired quality of life.[2] Effective and safe evaluation of chest pain is associated with reduced hospital admission, improved health care utilization, improved patient satisfaction and is cost effective. Post coronary bypass grafting (CABG) patients are often

referred to the pain clinic for management of symptoms of brachial plexus traction, scar pain, persistent costochondral junction pain or upper limb complex regional pain syndrome. In our literature search we did not find any case report of sympathetically mediated post CABG chest pain. We are reporting a case of a post CABG patient who was admitted in the cardiology unit with atypical chest pain. He was diagnosed as a case of complex neuropathic and sympathetically mediated chest pain. Chest pain was managed successfully with Stellate ganglion block and patient returned to work within two weeks time.

Case Report

A 62 years old man , security guard by profession was a known case of hypertension and ischaemic heart disease. He had CABG four month ago. He presented to the emergency room with left pre-cordial pain, which was spontaneous, dull, episodic and shooting in nature. On admission in cardiology service he was investigated for acute coronary syndrome. ECG, chest X-Ray, and laboratory investigations revealed no new change compared to previous examination. Initially diagnosis of refractory angina was made. Management for acute coronary syndrome was continued and coronary angiography was done, which showed patent coronary grafts and normal ejection fraction. A consultation was requested for chronic pain team. On evaluation the intensity of chest pain was 7/10 on visual analog scale (VAS) spontaneous ,continuous, dull and episodic shooting pain. It was aggravated by left arm movement and light touch. Mild swelling and skin colour changes were noted on sternotomy scar but there was no temperature changes. Initially patient was managed with intravenous morphine infusion, oral Gabapentin and tricyclic antidepressant. No relief in symptoms occurred in one weeks time. Diagnostic left stellate ganglion block was planned and given with bupivacaine and depomedrol. Stellate ganglion block provided instant pain relief. The patient was discharged on tramadol, gabapentin and tricyclic antidepressant. On follow-up after one week the patient's symptoms were markedly relieved. Medication were tapered off gradually. Patient remained symptom free and returned to work after two weeks.

Discussion

The diagnosis of our patient was complex because symptoms were of nociceptive, neuropathic pain and localized autonomic changes were noticed. Relief of symptoms did not occur with pain modulator, anticonvulsant and morphine infusion. They were relieved with Stellate ganglion block. The exact mechanism of severe chronic chest pain , hyperalgesia and allodynia in our patient is not known.

However chronic pain accompanied by autonomic dysfunction in the same region is taken to indicate reflex sympathetic dystrophy. Typically hyperalgesia to light touch is present in addition to the spontaneous pain. The absence of heat hyperalagesia indicates that the underlying mechanism is central rather than peripheral sensitization. This mechanism is similar to that of secondary hyperalgesia in the intact skin surrounding an injury site. Sympathetically mediated pain is not due to hyperactivity of sympathetic efferent but receptor super sensitivity probably by over expression of alpha-1 adrenergic receptors on nociceptive primary afferents. Normal level of norepinephrine can cause pathological spontaneous activity of nociceptors which maintain the central sensitization.[3] Secondary hyperalgesia to mechanical stimuli is likely due to the sensitization of central pain signalling neuron. This sensitization could involve only input from nociceptors. Central sensitization could also be the result of enhanced connectivity between low threshold mechanoreceptors and central pain signalling. This form of sensitization may account for the pain to light touch associated with neuropathic pain. Receptor field plasticity is a prudent property of dorsal horn nerves and probably plays a vital role with regard to hyperalgesia.[4]

Stellate ganglion block has been extensively used in clinical practice for the management of painful condition such as cephalic, facial, ocular[5], refractory angina[6,7] and upper limb pain. Yet its mechanism of action and its analgesic efficacy are poorly understood. The mechanism of action may involve reduction of substance P in the spinal cord and plain catecholamine release caused by noxious stimulation.[8]

Early recognition and aggressive management of neuropathic sympathetically mediated chest pain is critical to successful outcome. This case illustrates that the diagnosis of sympathetically mediated pain is essentially clinical and that proper diagnosis and treatment with sympathetic blockade can be very rewarding. Stellate ganglion block offers an important therapeutic option for treatment of undifferentiated post CABG chest pain.

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