

Symptom Oriented Pain Management- A review

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INTRODUCTION

Pain is as old as humankind. Pain management is fast growing specialty. It is defined as a “discipline of medicine devoted to the diagnosis, treatment of pain and its related disorders”. The International Association for the Study of Pain (IASP) has defined pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage”.

Melzack and Wall’s “Gate Control Theory” has opened new avenues for pain management. The neuropathic pain is “pain arising as a direct consequence of a lesion or disease affecting the somatosensory system”.

Pain can be acute or chronic. Acute pain is as a result of trauma, surgery or postoperative. The transformation of acute pain to chronic pain which is debilitating and frustrating. The chronic postsurgical pain (CPSP) is a multifactorial process involving surgical technique, environmental factors, and genetics. The nerve injury results in the development of a chronic neuropathic pain.

Chronic pain is of complex nature, comprised of physical, psychological, and social components. Chronic pain has been defined as unresolving pain lasting for a period longer than 3 to 6 months.

Chronic pain is no more a Symptom but considered as Disease such as hypertension and Diabetes mellites.

Chronic pains seen at Pain Management Clinic Violence; workplace; doctors; trends.

Headache- is common of medical complaints and are primary and secondary. Primary are migraine, tension type headache, and cluster headache. The symptoms are nausea, vomiting, hypersensitivity to light, noise, associated with aura or visual symptoms, fever, arthralgias and malaise.

The causes of secondary headaches are intra cerebral bleed, and brain tumours.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications ex. analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The supra orbital, superficial temporal, occipital nerve blocks and surgery is advised.

Trigeminal Neuralgia- is episode of neuralgic pain, over the distribution of one or more divisions of the trigeminal nerve. The pain is paroxysmal episode of a cluster of lancinating or ‘electric shock’ like pains, severe to excruciating in intensity lasting from a few seconds to a few minutes and keeps recurring, leaving a pain free interval (‘refractory period’) between the episodes.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications ex. analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy; counselling and surgery microvascular decompression.

The trigeminal nerve or ganglion block with local anaesthesia and steroid or rf ablation are advised.

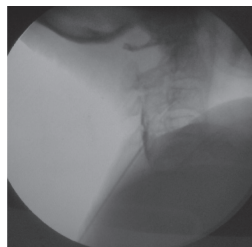
Cervical Radiculopathy- is a dysfunction of a spinal nerves from C5 to T1.

The cause is nerve root irritation, secondary to disk herniations or degenerative changes.

Symptoms- are pain in the neck, shoulder and arm with associated changes in the sensory, motor and deep tendon reflexes.¹ It is typically a pins and needle, burning, shooting lancinating pain in a dermatomal pattern, in one or both arms. One must rule out herpes zoster, thoracic outlet syndrome and brachial plexus neuralgia, disorders of rotator cuff or Pancoast tumour and sympathetic pain.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications ex. analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The pain blocks such as cervical epidural steroid injection (Fig. 1); nucleoplasty, cervical traction and surgery.



Graph 1: Showing Age and sex distribution

Cervical Facet pain- is neck pain with radiation to the head, shoulders and arms arise from the cervical zygapophysial (facet) joints. The pain may radiate to the head or down to the trapezius, shoulder, arms and even to the fingers, with subjective numbness.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The pain blocks such as cervical facet injection and medial branch block with radio frequency ablation. (Fig. 2)



Fig. 2- Cervical Facet- lat. view

Cervical Discogenic pain- is focal axial neck pain with frequent occipital headaches, with or without referred pain into shoulders and between the scapular blades. There may be complains of tightness and muscle spasms in the neck with limitation of range of movement.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The provocative discography is advised. (Fig. 3).



Fig. 3 Cervical Discogram- AP View

The surgical options are anterior cervical discectomy and fusion or artificial disk replacement.

Lumbar Radiculopathy- is nerve irritation caused by damage to the disc or from degenerative disc disease and commonly recognized "sciatica" pain that shoots down a lower extremity.

Symptoms-include sharp pain in the back, extending to the foot; pain with sitting or coughing; numbness or weakness in the leg and foot; numbness or tingling in the back or leg and sensation or reflex changes, hypersensitivity. In case of weakness, foot drop, called as red flags then surgery is advised.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment-includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The pain blocks such as trans foraminal lumbar epidural (Fig. 4) steroid injections.

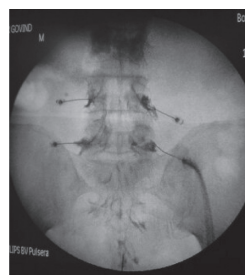


Fig. 4- Trans foraminal Lumbar Epidural Steroid injection

The surgical options are decompressive surgery such as laminectomy and/or discectomy/microdiscectomy.

Lumbar facet joint pain- is cause of low back pain which can be unilateral or bilateral with or without radiation to the buttocks, hips, or legs without dermatomal distribution. The pain from the facet joints is seen with repetitive use such as frequent extension, lateral bending, or twisting of the spine. The sudden sheering forces to the joints sustained during motor vehicle accidents, work related injuries, sports injuries can result facetal pain.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The diagnostic facet joint block with steroids (Fig. 5) and radiofrequency ablation of the medial branches either by a heat (thermal) lesion or pulsed mode. (Fig. 6)

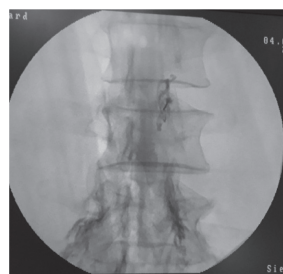


Fig. 5- Lumbar Facet

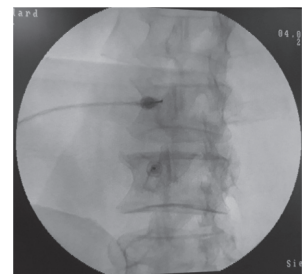


Fig. 6- Lumbar Median branch RF

Lumbar spinal Stenosis- is a cause of pain and disability due to narrowing of the spinal canal and/or neuroforamen, in elderly. The prevalence and overall burden of LSS continues to grow in the aging population.^{2,3} In elderly it is a chronic disease of degenerative narrowing of the spinal canal leading to compression and ischemia of the spinal nerves.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes use of medications such as analgesics, NSAIDs, neuropathic, antidepressants; physiotherapy and counselling. The interlaminar lumbar epidural with mixture of local anaesthetic and steroid.

Central canal stenosis- results from a decrease in the anteroposterior or transverse space, or a combination due to disk height loss. This can occur with or without herniation of disk and hypertrophy of the facet joints and the ligamentum flavum.

Symptoms-are coupled with paraesthesia's into the lower lumbar region, buttocks and eventually down the legs. The distribution of pain in the lower extremities is dependent on the location of stenosis and cramping like sensation. The EMG/NCS helps determine if a coexisting peripheral neuropathy.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes use of medications such as analgesics, NSAIDs, neuropathic, antidepressants; physiotherapy and counselling. The interlaminar lumbar epidural with mixture of local anaesthetic and steroid is advised.

Lumbar discogenic pain- is cause of pain and disability in the industrialized nations which results in significant economic and public health burden. It is leading cause of absenteeism and lost productivity. In approximately 40% of LBP complaints in adults, the aetiology of pain can be attributed to a discogenic origin.^{4,5} The discogenic pain is a very complicated and multifactorial. However, biological, mechanical, and environmental factors are widely considered as key contributors to the degenerative process.⁶

Symptoms & Signs-pain is aggravated by upright sitting, lumbar flexion, coughing, sneezing, or activities that increase intradiscal pressure. Pain may radiate in dermatomal distribution into the leg, characterized as achy, burning, or electrical shock and is often described as a shooting or stabbing pain.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment-includes use of medications such as analgesics, NSAIDs, neuropathic, antidepressants; physiotherapy and

counselling. The provocative discography to locate level of disc (Fig. 7) followed cooled RF ablation or by percutaneous or endoscopic discectomy.



Fig. 7- Lumbar Discogram

Sacroiliac joint pain (SIJ)- is cause of low back pain, being the largest weight bearing joint in the body, with a prevalence of between 15% and 40%.^{7,8} The paired SIJs distribute body weight across the pelvis and lower limbs following the curvature of the pelvis in a dumbly shape.

Causes- of SIJ pain are: Intra-articular: Arthritis, ankylosing spondylitis; myofascial pain, ligament injury, attachment injury etc.; Shear forces: Post lumbar fusion surgery, pelvic fractures, abnormal gait associated with leg shortening. In late pregnancy, the lax ligaments in the pelvis and weight gain put extra strain on the spine.

Signs and Symptoms- pain is experienced in the gluteal area over the SIJ and into the buttock, thigh and knee. It can mimic sciatica with difference of normal straight leg raising tests to differentiate from SIJ pain. Pain is often exacerbated by turning over in bed, putting on shoes and socks and leg lifting to get into or out of a car or out of bed in the morning; prolonged sitting or standing can exacerbate the pain and stiffness, which is not helped by walking.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The SI joint pain block (Fig. 8) with mixture of local anaesthetic and steroid or RF ablation.

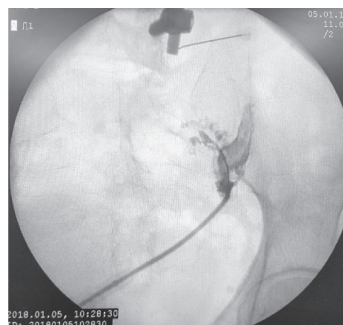


Fig. 8- SI Jt. Block

Coccygodynia- is pain in the region of the coccyx, typically is triggered by or occurs while sitting. It is five times more prevalent in women than men and the average age is 40 years.⁹ It occurs after direct trauma or a fall directly on coccyx and after difficult vaginal delivery; duration of time spent sitting; when they sit on their legs or on one buttock. The pain is more in women during the premenstrual period or sexual intercourse. The history of constipation and blood in the stool is suggestive of the tumour or metastasis. The rectal examination or manipulation is painful.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The pain block is coccygeal nerve block or ganglion of impar block with local anaesthetic and steroid.

Piriformis Pain Syndromes (PF)- is a neuromuscular disorder that occurs due to compression of sciatic nerve compression which irritates piriformis muscle.

Symptoms-pain, tingling and numbness in the buttocks and along sciatic nerve down the lower thigh and into the leg. PF affects athletes, following surgery or trauma of the piriformis muscle.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling.

The injection into piriformis muscle, bursa, tendon or ganglion of impar block.

Psoas or Iliopsoas Syndrome- Iliopsoas muscles help in flexion of the hip. The tendon is attached to the thigh bone to the muscle and iliopsoas bursa is the largest bursa in the body. The iliopsoas bursitis/tendonitis is caused by overuse and friction which is associated with lifting, unloading trucks, and in sports requiring extensive use of the hip flexors (e.g. soccer, ballet, uphill running, hurdling, jumping).

The pain can be from osteoarthritis hip; tight iliopsoas; iliopsoas bursitis or tendinitis; rheumatoid arthritis; secondary mechanical wear or impingement from orthopaedic hardware.

Symptoms- The pain in the hip and thigh region, hip stiffness and a clicking or snapping feeling in the hip. The snapping hip syndrome may be caused by the iliopsoas tendon catching on the pelvis when the hip is flexed. The initial pain happens when rising from a seated position even standing, walking or lying down is not comfortable and extending the leg while driving.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The injection into iliopsoas; Iliopsoas Bursa Injection and Iliopsoas Tendon.

Levator Ani Syndrome- symptoms are typically dull, aching or pressure like discomfort in the rectum. The prolonged sitting and defecation precipitate the pain lasting for 20 minutes or longer.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The injection into levator ani muscle or ganglion of impar block.

Pudendal Neuralgia- could be due to pudendal nerve entrapment (PNE) chronically compressed in the ischiorectal fossa results in pain.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The pudendal nerve block, RF ablation or ganglion of impar block.

Types of Urogenital Pain

Orchialgia/Testicular Pain- could be due to epididymo-orchitis; infection, tumour, testicular torsion, varicocele, hydrocele, spermatocele, trauma and surgeries such as vasectomy, inguinal hernia repair or testicular surgery.

Bladder Pain Syndrome (BPS) OR Interstitial Cystitis- BPS is a complex issue affecting urinary bladder and is characterized by pelvic pain, urinary urgency, frequency and nocturia. It is a severely debilitating syndrome with poorly understood aetiology.

Vulvodinia- is defined as vulvar burning or pain is tightly localized by point pressure 'mapping' by probing with a cotton-tipped applicator or similar instrument.

Urethral Pain Syndrome- is characterized by recurrent episodic urethral pain, usually on voiding, with daytime frequency and nocturia.

Anorectal Pain Syndromes- persistent or recurrent, episodic rectal pain with rectal trigger points/tenderness related to symptoms of bowel dysfunction.

Proctalgia Fugax- is sudden, severe, aching, cramping, gnawing or stabbing rectal pain lasting seconds to minutes that seems to arise in the rectum.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment-includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The blocks include ilioinguinal, genitofemoral; superior hypogastric plexus (Fig. 9) and ganglion of impar block with local anaesthetic, neurolytic or rf ablation in select patient.

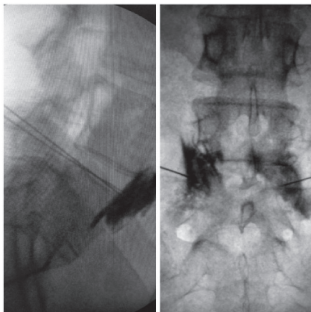


Fig. 9 Superior Hypogastric plexus block

Cancer Pain Cancer pain management is a complex one. It involves treatment of disease; associated effects and pain relief. It affects physically and financially to patient his or her family to society and nation at large.

Cancer pain may have various presentations (i.e. visceral, somatic, neuropathic) and affect different regions of the body. There is need of pain assessment; understanding various painful conditions; proper diagnosis. The multimodal treatment modalities include medications, interventional, physiotherapy, psychological and alternative therapies.

Symptoms- are pain, nausea, vomiting, constipation; loss of appetite and weight; malaise, fatigue; fever & chills ; anxiety & depression or suicidal tendency and reduction in quality of life. The additional symptoms are coughing, shortness of breath, or chest pain in cancer lung and blood in the stool in colon cancer

Head and Neck Cancer- refers to malignant tumours that arise in the mucosa of the oral cavity, pharynx, larynx, nasal cavity, and paranasal sinuses.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The maxillary, hypoglossal nerve block, RF ablation are advised.

Breast Cancer: is one of the most prevalent types of cancer.

Symptoms-Pain may be a late symptom, due to involvement of muscles, ribs.

The neuropathic pain following surgery, radiotherapy, plexopathy or scar pain.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The brachial plexus, intercostal (Fig. 10), paravertebral nerve blocks are advised.

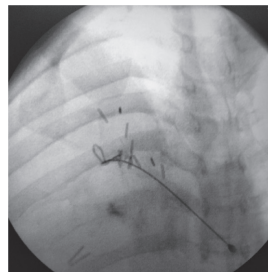


Fig. 10 Intercostal nerve block

Carcinoma Lung: Pain due to the disease itself: chest wall involvement; pleural disease-mesotheliomas, invasion from lung parenchyma; metastatic disease to ribs, vertebra, sternum, scapula; Invasion of brachial plexus from Pancoast's tumour.

There may be post-thoracotomy pain; post-irradiation pain and plexopathy; chemotherapy-induced peripheral neuropathy.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment-includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The intercostal, paravertebral nerve and intrapleural block are advised.

Upper Abdominal Pain: is due to tumours such as pancreas, liver, gallbladder, omentum, mesentery, alimentary tract from stomach and transverse portion of large colon. All these organs are innervated by celiac and splanchnic plexus.

Causes of Pain-Tumours arising from stomach, liver, gallbladder, kidney, spleen, pancreas, aortic lymph adenopathy, omental mass.

Symptoms- Pain in epigastrium, right or left hypochondrium referred to back. Pain is usually vague, deep, squeezing, crampy, or colicky, stretching, compressing due to invading or distention of visceral structures, burning sensation or sharp stabbing. Pain is referred to back or to left or right shoulder, e.g. shoulder pain that appears when the diaphragm is invaded with tumour; Inability to lie down on the back; Nausea/ vomiting; Constipation; yellowish discoloration of skin; Insomnia and Irritability, depression or anxiety.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment-includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling.

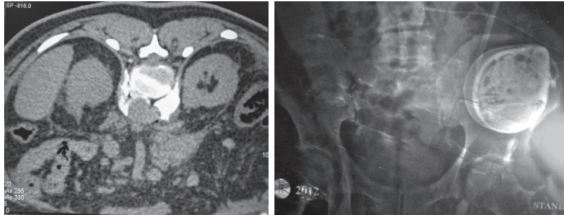


Fig. 11- CT guided Coeliac Plexus block Fig. 12- Implantable Pump in situ

The CT guided neurolytic blocks of splanchnic or celiac plexus (Fig. 11) are effective in controlling visceral cancer pain. In some Intrathecal implantable pump (Fig. 12) is implanted into the abdominal wall for pain relief.

Malignant Pelvic Pain- is due to endometriosis, uterine leiomyoma, adenomyosis, endometrium cancer, Vulvar condyloma, Cervical cancer, bony tumours of Pelvis, Prostate Cancer, urinary bladder, testicular tumours.

Symptoms- include abnormal bleeding, increase pelvic pressure and pain, pain is more with tumour necrosis.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment-includes use of medications analgesic, trans dermal patches and antidepressants; physiotherapy and counselling. The pain blocks advised are epidural block, intrathecal, subarachnoid block, ganglion of Impar.

Metastatic Bone Pain- Bones are the third most common metastatic site after lungs and liver.¹⁰

Bone metastases are classified as osteolytic, or mixed, according to interference with normal bone remodelling. The skeletal complications present as pathologic fractures, spinal cord compression, and hypercalcemia.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment-includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The use of chemotherapy, radiotherapy, hormone therapy, Systemic Radioisotope are useful.

Ischaemic Pain Causes- are atherosclerosis; arterial fibro dysplasia; arterial dissection, vasospasm, embolism/thrombosis; trauma; thoracic outlet obstruction; Burger's disease.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. For viable limb revascularization, use of anticoagulants Urokinase, Alteplase, Reteplase, Tenecteplase, Heparin-the optimal dosing is unclear. The blocks ex. sympathetic: Stellate Ganglion, Lumbar; spinal cord stimulation (SCS) are advised. These will help to improve microcirculatory blood flow, relieve ischemic pain and reduce amputation rate in peripheral arterial occlusive disease (PAOD).¹¹ In case of non-viable limb with signs of tissue loss, nerve damage, and sensory loss, will require amputation

Myofascial Pain

The term "Myofascial pain" was coined by Janet Travell who observed that referral pain from fascia was like that of the contractile muscle element.¹²

Myofascial pain is characterized by the presence of trigger points. Trigger point is defined as an exquisitely tender spot in discrete taut bands of hardened muscle that produce local and referred pain, among other symptoms.

Myofascial trigger points (MTrPs) are present in radiculopathies, nerve entrapments, bone or joint in the stage of healing, congenital musculoskeletal abnormalities, metabolic disorders, nutritional imbalances, and regional biomechanical imbalances.¹³

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling.

The modalities dry needling; intramuscular stimulation; therapeutic massage; Acupuncture; and Transcutaneous electrical nerve stimulation (TENS) can decrease pain, muscle tenderness and improve function.

Fibromyalgia

Fibromyalgia is a chronic condition of unknown aetiology. It represents with generalized pain with fatigue and sleep disturbances. The patients have depressive or anxiety disorder and disability and poor quality of life. It is a form of soft tissue rheumatism, a broad term including a group of disorders that cause pain and stiffness around the joints, and in muscles and bones.

Symptoms- are generalized body pain with fatigue; disturbances of sleep, feeling tired, mood alteration exhaustion, headache and abdominal pain.

Signs- presence of tender points in the muscles. A tender point on one side of the body usually has a matching tender point in the same place on the opposite side of the body.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment-includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy.

Nonpharmacological- such as Counselling, relaxation techniques, mind and body therapy, aquatic exercise training and cognitive behavioural therapy. The tips to get sound sleep such as Do not sleep during daytime; avoid exercise, alcohol, caffeine and tobacco at least 3 hours before going to bed; Do not watch TV, read or work in bed; sleep at same time each night and get up at same time in the morning; sleep only in a bed and relax during weekend period are very effective.

The yoga, relaxation therapies; and Transcutaneous electrical nerve stimulation are useful.

Complex Regional Pain Syndrome (CRPS)

CRPS is a regional painful condition. The cause is not known one theory suggests that CRPS is a result of the triggering of the immune response. Which results in inflammatory symptoms of redness, warmth and swelling in the affected areas.

Symptoms- burning with shooting sensation complains of increased sensitivity to touch i.e. allodynia and report that even light breeze can precipitate symptoms i.e. hyperalgesia.

Signs- usually neuropathic in nature and manifest near the site of injury. The patients may have muscle spasm, dystonia, changes in skin colour, stretching and thinning of skin, dryness of skin, swelling and changes in skin temperature and trophic changes.

The pain in CRPS is continuous and results in emotional physical stress.

Investigations-apart from routine investigation thermography is a diagnostic test used to measure the heat emitted by the body. The use of a colour coded thermogram gives a visual indication of variations of blood flow in various parts of the body of the subject. In thermography, temperature is measured in symmetrical parts of the body. A temperature difference of greater than 1°C is considered significant.

The other symptoms changes in bone density by dexascan and bone scintigraphy for vasomotor and trophic changes; EMG for nerve injury.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. The aim is to relieve pain to maintain function and to resume a normal life as best as possible.

For neuropathic pain calcitonin and daily dose of naltrexone 50 mg up to 100mgm maximum per day. A depot preparation of 350mgm injection per month is given.

Physical Therapy-purpose is to restore and maintain functional status and attempts to desensitize the affected body.

Psychotherapy- symptoms such as depression, anxiety and occasionally post-traumatic stress disorder are tackled for rehabilitation of these patients.

Sympathetic Nerve Block- with local anaesthetic followed by neurolytic agent or rf ablation and IV injection of phentolamine into the affected limb as a Bier block; Stellate ganglion nerve block for upper limb (Fig 13); lumbar sympathetic plexus block for lower limb. (Fig. 14).

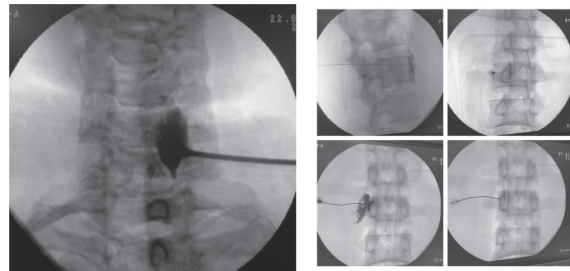


Fig. 13- Stellate ganglion block

Fig. 14- Lumbar Sympathetic block

MC5-A Calmare Device- The MC5-A Calmare© delivers patient-specific cutaneous electrostimulation, resulting in 'scrambling' pain information with 'no pain'. The goal is to reduce the perception of pain intensity.

Hyperbaric Oxygen Therapy (HBOT)-The therapeutic effects of HBOT are based on a supraphysiologic increase in the amount of dissolved oxygen carried by the blood. This increase allows oxygenation of ischemic areas with compromised circulation. HBOT activates oxidant-antioxidant mechanisms via an endothelial nitric oxide (NO) pathway, which plays a key role in stimulating secretion of growth factors such as vascular endothelial growth factor, hypoxia inducible factor-1, and stem cells.

By activating signal transduction cascades, HBOT has been shown to mediate tissue healing and improve post ischemic and inflammatory injuries. HBOT may cause an immediate and prolonged analgesic effect which is initiated and maintained by NO and NO dependent release of endogenous opioids.

Amputation is done for pain followed by a dysfunctional limb.

Spinal cord stimulator can be used in the treatment of CRPS. (Fig. 15)

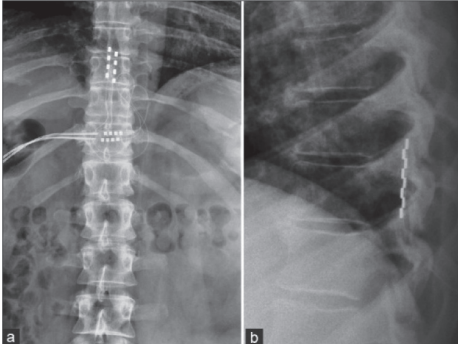


Fig. 15- Spinal cord stimulator

Intrathecal Pumps-are used to treat resistant CRPS to reduce side effects and patients require large doses of medications. The medications used include opioids, local anaesthetic, clonidine, baclofen, and ziconotide.

Ketamine- is given as a low dose sub-anaesthetic infusion of between 10 and 40 mg per hour for 5 days, under supervision of physician. Inj. Midazolam 2mg stat followed by 2 mg 2 hours into the infusion to reduce the hallucinations related to ketamine.

The clonidine 0.1 mg tablet is given before the infusion to potentiate the pain-relieving effects of ketamine.

Phantom Limb Pain

Patients may experience both phantom (nonpainful) sensation and phantom limb pain in amputated and absent limb. There are three primary theory-are peripheral, spinal plasticity and cerebral reorganization. Patients describe their pain as burning, crushing, or feeling like they have been stabbed with needles in the missing limb; often describe pain in the lower missing extremity as if their toes were tightly flexed and in the upper extremities as if their fingers were tightly clenched.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment-includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling.

Other modalities- Mirror Box Manipulation, excision of stump neuromas, sympathetic blocks, cordotomy, dorsal root entry lesions.

Postherpetic Neuralgia (PHN)

Pain following an acute infection of Herpes Zoster (HZ), develops pain along the affected dermatome. The rash of HZ develops after the pain presents in the dermatome of the affected nerve. The rash is characterized by blistering and close groups of red bumps and the affected area appear reddened and new waves of blisters occur for several days as old lesions crust over. The rash is associated with viral manifestations, such as fever, lethargy, as well as lymph adenopathy.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as antivirals, analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants, topical agents; vaccination; physiotherapy and counselling. Pain blocks such as epidural steroid administration; sympathetic blockade, intercostal or peripheral nerve blocks and spinal cord stimulation.

Post-laminectomy Pain

Post-laminectomy pain syndrome specifically refers to recurrent or persistent pain and disability following surgical laminectomy. The common causes of failed back surgery syndrome are: foraminal stenosis; painful disk; pseudarthrosis; neuropathic pain; recurrent disk herniation; iatrogenic instability; facet joint pain; sacroiliac joint pain; arachnoiditis and epidural and perineural fibrosis due to revision surgeries.

Localized tenderness helps to identify the source of pain such as facet joint, sacroiliac joint, vertebral body or soft tissues.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling. Pain blocks such as epidural steroid, facet blocks, medial nerve rf ablation, epidural adhesiolysis, neuroablation techniques, spinal cord stimulation.

Restless Leg Syndrome (RLS)

The exact cause of (RLS) is not known and can begin even during childhood. There is a strong genetic link and the risk factor can be iron deficiency. The RLS is thought to be caused by, some type of malfunction of the motor system more specifically of the dopamine pathway. RLS is a sensory cum motor disorder and can be

idiopathic or secondary.

RLS is susceptible to middle-aged and elderly, pregnant women, one with genetic link whose parents had experienced it; one who has sleep disorder called periodic limb movement and people on antidepressants.

Symptoms and Signs-are aching, creeping, crawling, restless; 'jimmy legs'; have uncomfortable sensations in their legs (and sometimes arms or other parts of the body) and an irresistible urge to move their legs to relieve the sensations. The condition causes an uncomfortable, 'itchy,' 'pins and needles,' or 'creepy crawly' feeling in the legs. The sensations are usually worse at rest, especially when lying or sitting.

After clinical examination and relevant investigations following multimodal approach is used.

Treatment- includes medications such as analgesics, neuropathic pain drugs, muscle relaxants, anxiolytics, antidepressants; physiotherapy and counselling.

Nonpharmacologic Therapy- Sleep improvement; Mind-distraction activities, e.g. video game, crossword puzzle; Yoga; Relaxation exercises; Music therapy; Hot bath or soothing massage and Exercise, e.g. walk in the evening.

Interventional- Botulinum toxin injection; nerve block; Lumbar sympathetic block; Acupuncture.

Preventive/Avoid- Nicotine, caffeine, alcohol, dopamine antagonist, metoclopramide; Diphenhydramine, SSRIS, e.g. Prozac.

Regenerative Medicine- The term regenerative medicine is an umbrella-term used to describe the use of biological agents to stimulate a healing response in various tissues throughout the body.

Platelet-rich plasma (PRP) has been useful to treat a variety of acute and chronic musculoskeletal and spine injuries such as osteoarthritis, tendinopathy, chondropathy, muscle and ligamentous tears, disks and spinal bony and soft-tissue structures.

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Role of Physiotherapy

Goal- are to provide relief of pain and muscle spasm; prevention of contractures and deformity; improve and/or maintain the range of motion and strength; optimize functional abilities to pre-morbid levels.

Modalities- Shortwave Diathermy; Ultrasound; Cryotherapy; Neuromuscular Electrical Stimulation; Iontophoresis; Transcutaneous Electrical Nerve Stimulation; Interferential Current; LASER; Electromyography Biofeedback;

Manual Therapy Techniques- Soft tissue mobilization/Massage (cross friction, kneading, etc.); Myofascial release that involves application of a sustained, low pressure force to the myofascial structures to “free” restricted areas; Craniosacral therapy; Joint mobilization (spinal and peripheral joints); improve flexibility; Muscle energy techniques and Kinesio taping to promote appropriate muscle function and reduce pain.

Role of Psychiatry

Chronic pain can have physical, emotional or cognitive symptoms or it can be associated with syndromal psychiatric disorders. The relationship of chronic pain and psychological stress is probably bidirectional, i.e. each one can lead to and/or aggravate the other.

Medications

Antidepressants; Serotonin-norepinephrine Reuptake Inhibitors; Tricyclic and Tetracyclic antidepressants; Selective Serotonin Reuptake Inhibitors;

Psychotherapy- helps not only in patients who have comorbid depression or anxiety but also in those who do not have any psychiatric comorbidity. Cognitive behaviour therapy helps the patients learn how to cope effectively with the chronic pain.

Role of Radiation Therapy

Pain initially responds to analgesics, but eventually cocktail of analgesics fails to suppress pain the radiation is an option to alleviate pain. There are three types of radiation- alpha, beta and gamma radiations. All of them kill cancer cells.

The exact mechanism by which radiation alleviates the pain is not known. One of the mechanisms is that radiation reduces the tumour size by killing cancer cells and thus the pressure effect from the tumour mass is relieved, which results in pain palliation. Another mechanism is inhibition of chemical mediators of pain. In bone pain, osteolysis is reduced and thus pain is reduced.

Isotope Therapy- isotopes are phosphorus-32, strontium-89, samarium-153, rhenium-188, 177-lutetium, radioiodine (131-I) and radium-223.

Role of Chemotherapy

These modalities can be broadly classified as: Cytotoxic chemotherapy; Biologic and targeted therapy;

Hormone therapy; Bone-targeted agents.

Cytotoxic Chemotherapy- is useful for pain relief in conditions where the tumour is directly responsible for pain due to infiltration of surrounding tissue. For example, in a breast cancer patient, chemotherapy will decrease the symptoms of brachial plexopathy, only if it is due to the tumour infiltration and not the one due to prior radiation therapy.

Biological and Targeted Therapies- help in disease control and thus the tumour pain. They have better efficacy and toxicity ratio thus improve the quality of life and pain relief due to primary and metastatic disease.

Hormone Therapy- Breast and prostate cancer are hormone dependent cancers (oestrogen and testosterone respectively) and certain subsets of these cancers respond to hormonal manipulation.

Steroids like dexamethasone and prednisolone are useful in relief of cancer pain. Tumours like lymphoma, leukaemia, myeloma and prostate cancer are steroid responsive and reduction in tumour size.

Bone-directed Therapies- These drugs do not have a significant anticancer activity on the tumour per se but work on the bone

microenvironment. Bisphosphonates (clodronate, pamidronate, zoledronic acid and ibandronate) are structural analogues of pyrophosphates, a naturally occurring component of bone crystal deposition.

Chemotherapy - agents vinca alkaloids (vincristine, vinblastine) cause neurotoxicity. Cisplatin linked with neuronal death leading on to loss of large myelinated nerve fibres can induce sensory neuropathies

Treatment- for neuropathies following chemo, radiation therapies are analgesics, neuropathic pain drugs, topical agents.

Role of Oncosurgery- Palliative interventions, (both operative and nonoperative) are used with noncurative intent to improve quality of life, pain control, symptom relief and possibly survival. Surgical palliative procedures fall generally into three areas of concern, viz. bleeding, obstruction and perforation.

Conclusion- Chronic pain is complex issue, and disease by itself. Its effects are widely seen in all body systems. The multimodal approach by involving of many specialists, paramedics and trained nursing staff to handle these patients with tender care. The aim is to have Total Pain Relief and Improve Quality of Life.

Recommended Reading

- 1- Symptom Oriented Pain Management 2nd Edition- Baheti, Bakshi, Gupta & Gehdoo by Jaypee Medical Publishers, New Delhi- 2017
- 2- Interventional Pain Management 2nd Edition- Baheti, Bakshi, Gupta & Gehdoo By Jaypee Medical Publishers, New Delhi- 2016
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