

## Identifying Lateral Knee Pain Using Sodium Channel Blockers “Distally” at ankle.

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**Abstract:** Common complaint of lateral or para patellar knee pain seen in outpatient is sometimes perplexing. It is seen in younger age group may be labelled as chondromalacia, in midage seen as bursitis, tendinitis and aged group as osteoarthritis or related pain. We have seen a new symptom and sign group of lateral knee pain. We have devised a clinical test to diagnose and confirm this pain by new methodology based on gore sign.

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### I. Introduction

Knee pain is a common problem and has high incidence and prevalence in Indian population.<sup>1</sup> It is seen in close to 18 % population<sup>2</sup>. Above incidence and prevalence study has been primarily related to osteoarthritis of knee. In literature knee pain, sometimes is called as black hole as there are multiple explanations and likely causes. The reliability of various methods and classification of knee pain is not studied well yet.<sup>3</sup> In our clinical practice, we have observed a new knee pain syndrome that does not fit a classical osteoarthritis, or chondromalacia or tendinitis and bursitis. This pain is non-trauma, non-infective and non-ischemic and non-degenerative for the knee joint.

We have had experience of treating patients with sciatic pain due to disc herniations surgically under local anesthesia when they are awake and aware. This has given us a different perspective on pain origin.<sup>4</sup> Classical sciatica mediated by L5 involvement many times presents as knee pain. Detailed account of sciatica new understanding is already published.<sup>5</sup> The present study is to evaluate lateral knee pain and confirm if it is neuralgia and describe the new symptom group.

### II. Material

A total of 60 patients were studied.

Age range 23 to 64.

Male 31 females 29.

Right knee more common than left.

Inclusion criteria:

The knee pain present on lateral aspect of knee. Pain felt along posterolateral aspect of knee

Pain along lateral edge of patella. Pain felt over lower anterior lateral edge of patella in a spot.

Pain associated with tingling and numbness in lateral knee and leg on sitting cross legged for more than 15 minutes. Pain associated with sensory symptoms locally or along the leg. Pain may be throbbing.

Pain may go along the lateral calf on walking or prolonged standing.

Pain not associated with any trauma, infection or vascular cause.

Inability to flex the knee fully and inability to sit with legs crossed.

Pain felt in from of discomfort felt on sitting cross legged on ground, enough to make the person feel that leg must be made straight within 10-15 minutes of sitting.

### III. Method

Patients were clinically examined to assess trauma, infection, ischaemia or degenerative changes in knee as cause of pain. These patients were excluded from the study. The chosen patients were then subjected to modified clinical examination with special focus on involvement of the common peroneal nerve at knee and distally along the leg. Imaging studies were done for knee, but in spine in very few select patients only. We palpate the painful area and elicit tenderness of nerve at knee or behind the knee in popliteal fossa along common peroneal nerve. If the nerve was tender it was then palpated along leg up to ankle and its terminal part of deep peroneal nerve and sural nerve. The tender spot of the nerve at or around ankle was then injected with local anesthetic 2% plain lignocaine without adrenaline, 3 ml, and effect was seen after injection in 10 and 30 minutes. The volume injected was empirically decided.

#### **IV. Results**

Out of 60 patients 44 had the nerve tender at posterolateral part of popliteal fossa [common peroneal nerve]. It was found that in 84% patients the nerve was tender at ankle in area of deep peroneal nerve and in 30 % in area of sural nerve and 14 % in area of both nerves. The pain relief was noted for varying duration from 1 hour to 24 hours. It improved flexion mobility of knee where patient before injection was unable to flex the knee well beyond 20 degrees. The discomfort while sitting cross legged also reduced.

#### **V. Discussion**

Knee pain in lateral aspect at varied age is sometimes difficult to appreciate and diagnose. Once we rule out trauma, infection, ischaemia and degeneration at knee as the likely cause what remains probably is nerve mediated pain. Anatomically lateral knee is supplied by common peroneal nerve and its articular branches. These on lateral knee are superior, inferior and recurrent genicular nerves.<sup>6</sup> Our understanding of pain and nerve mediated pain along knee in general is improved because of surgery of the disc under local anesthesia in awake and aware patient by transforaminal endoscopy<sup>7</sup>, by use of RF to treat chronic pain at knee by nerve denervation and ablation<sup>8,9</sup>, by past studies in chondromalacia patella, lateral retinacular pain and its treatment, patellar mal alignment<sup>10-16</sup>, use of nerve blocks in knee replacement surgery and post-operative pain control<sup>17-18</sup>.

Our finding of tender common peroneal nerve at knee and its distal branch deep peroneal and its lateral terminal branch at ankle also tender is a new finding which we have reported previously in study of sciatica<sup>5</sup>. The injection of sodium channel blocker distally results in relief of pain for varying duration along the nerve involved in inflammation; that manifests as tenderness of the nerve. This may be taken as a test to identify the cause and the mechanism of the pain at knee as neuralgia. We used the physiological basis of nociceptor that it is a pseudo monopolar axon and using distal block we could relieve the pain immediately even though for a short duration enough to diagnose it. We have for the first time shown that injection of a sodium channel blocker distally and away from site of pain is effective in suppressing pain for a short duration. In clinical setting this may help in differentiating source of pain at lateral knee. This we want to term as reverse analgesia and distal block.

In some patients 18/60 it was found that nerve was not tender but patient on sitting cross legged got tingling over lateral knee and leg along distribution of L5 within 10 minutes or shorter duration. This finding of sensory symptoms on sitting cross legged in patients helped us propose that this is because of reduced stretch ability of nerve. We propose this as a new syndrome of pain at knee of nerve origin.

Sciatica has been noted as caused by mechanical causes or chemical priming of the nerve. The chemical cause can give tenderness of the nerve. Chemical cause can be detected by using tenderness of the nerve. This is known to be due to upregulation of sodium channels in the nerve. The nerve is a part of pseudomonopolar axon, “nociceptor” that behaves in similar way at both proximal [central] and distal [peripheral] end.

We generally use straight leg raising as indicative of mechanical compression of nerve. In sitting cross legged the nerve is stretched along its proximal course from greater sciatic notch to the knee. We feel that inability to sit with legs crossed in patients with knee pain may indicate a lack of stretch ability of the affected nerve. It is known that a mechanical compression of nerve root due to disc herniation can reduce blood supply when the root is stretched in vivo.<sup>19</sup> This reduced blood supply may result in tingling and then numbness.

In Indian patients, we see group with tender nerve and group with decreased stretch ability of nerve indicated by inability to sit cross legged we may be able to differentially diagnose an inflamed and or a mechanically compressed and less stretch able nerve. This may help us in proper planning of treatment and better outcomes.

In some of the asymptomatic patients we have noted tenderness of the nerve in a very mild way, this may be subthreshold effect of inflammation yet to manifest as pain. The question if this neuralgia is due to lumbar spine changes needs further study. Lumbar spine is very likely to be a site of pain generation as the dorsal root ganglia are situated at foramina of lumbar spine and may be experiencing chemical and mechanical changes with degeneration. Dorsal root ganglion covers a conical area of tissue apex at foramen and base on dermatome. This whole cone can be painful.<sup>20</sup> It is also noted that numbness and pain distribution is more useful for level diagnosis in upper lumbar disc related symptoms than objective neurological findings.<sup>21,22</sup> In 4/60 patients had pain which started radiating along the leg and posterolateral aspect of knee on prolonged standing and walking. This may be due to added stenotic canal giving claudication.

#### **VI. Limitations**

we have not done a comparative study of asymptomatic patients in large number and if the nerve is tender in them? We have also not used any other agent to inject at distal end of the nerve apart from lignocaine 2%. we have used No other concentration of lignocaine. We have also restricted this study to clinical

assessment and not imaging correlation to keep it very brave crisp and relevant for primary care. Further detailed study is needed before this idea can be supported and validated for larger community use.

## VII. Clinical relevance

Pain in lateral aspect of knee if not traumatic, infective or ischemic can be neuralgia. Reverse analgesia is based on physiological property of nociceptor being pseudo monopolar axon.<sup>23</sup> In clinical practice the sodium channel blocker can be safely used for diagnosis of lateral knee pain and relieving agonizing pain.

Author 1 has conceptualized the study and conducted it in clinic. Author 2 has done basic research on use of sodium channels and blockers in nerve mediated pain. Suggested the choice of sodium channel blockers.

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