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RESEARCH ARTICLE

SCIATICA MIMICKERS

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ABSTRACT

Objectives: To report few unusual causes of sciatica-like pain due to non discogenic causes. We propose a new terminology "sciatica mimickers" to describe these conditions.
Methods: A single centre retrospective study.
Results: All patients were evaluated by various imaging technique and treated either by conservative or surgically and improved with our treatment.
Conclusion: All sciatica is not due to disc prolapse, non discogenic causes of sciatica are not uncommon and should always be kept in mind in evaluation of patient with sciatica. We propose the term "sciatica mimickers" to describe sciatica like pain due to non discogenic causes.

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INTRODUCTION

The term "sciatica" commonly refers to a pain which extends from the sacroiliac region into the posterior or posterolateral part of the thigh and calf or lateral portion of the leg. The pain may continue as far as the heel or even into the lateral border of the foot. The independent point prevalence of sciatica in the adult population is greater than 5% (Filler, 2005) and its lifetime prevalence is as high as 40% (Frymoyer, 1992). Prior to 1934, sciatica was viewed primarily as the result of sciatic nerve entrapment in the pelvis (Freiberg, 1934 and Lasègue, 1864).But Mixter and Barr's (Mixter, 1934) widely respected publicationrevealed the clinical importance of lumbar disc herniation. Most common cause of sciatica is due to nerve root compression (90 % cases), 95 % of these are due to lumber disc herniation. Many patients with leg pain as the major complaint are referred to a primary care, physiatrist, neurology or orthopedics outpatient clinic, to assess presence of nerve root compression. In 30 % of the patients with a presumptive diagnosis of a lumbar disk herniation, the diagnosis could not be confirmed by radiological imaging studies or even during operation (Modic, 1995 and Ohnmeiss, 1997). New diagnostic technology is now able to demonstrate that many cases of sciatica are in fact due to causes unrelated to disc lesions (Moore, 2001) such as Pyriformis syndrome and distal foraminal impingements.

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Symptoms of sciatica can be recalcitrant; over 50% of people reporting sciatica indicate a pattern of intermittent presentation, with relapse being common (Tubach, 2004 and Miranda, 2002). This pattern has been estimated to increase the prevalence of long-term disability by 10%[30] and to triple the likelihood that people will seek additional medical care (Carey, 1999 and Cherkin, 1996). Low back and leg pain has been reported to stay the same or worsen in 30% to 40% of patients seeking both surgical and nonsurgical treatments for sciatica (Atlas, 1976). Nonsurgical management is recommended for the majority of patients with low back pain and sciatica, at least during the initial weeks of symptoms (Koes, 2007). We report few unusual causes of sciatica which are not due to intervertebral disc prolapse. All patients came to us with similar complaints of leg pain with or without back pain which mimics sciatica but on evaluation it was found that they were sciatica of nondiscogenic origin.We propose the terminology "sciatica mimickers" to describe these conditions.

MATERIALS AND METHODS

This is single centre retrospective study from January 2013 to December 2014 at a tertiary level university hospital. There was a total of 14572 out patients seen by the spine unit, department of orthopedics of our institute during the period. Out of 14572 out patients, there were a total of 5565 new patients attending the spine clinic. 1275 patients presented with sciatica symptoms and we encountered 10 patients who presented with sciatica like symptoms due to non discogenic

causes. All patients had varying degrees of positive straight leg raise test (SLR). All patients were evaluated in details to find out the etiology and treated accordingly.

Case Series

Case-1- Aneurysmal Bone Cyst (ABC)

A 29-year-old female presented to us with complaints of lower back pain for 5 years which got aggravated in last 6 months with radiation to right leg. On examination, straight leg raise test (SLR) was positive at 45 degrees on right side. She was evaluated clinically and radiologically with plain radiographs, CT (Figure-1) and MRI which were suggestive of aneurysmal bone cyst. She was treated with pre-operative embolisation of tumor followed by anterior vertebrectomy with instrumentation and cage reconstruction. Histopathological examination of the excised tumor confirmed the diagnosis of aneurysmal bone cyst. On follow up after 18 months patient is asymptomatic and able to do her daily routine activities.

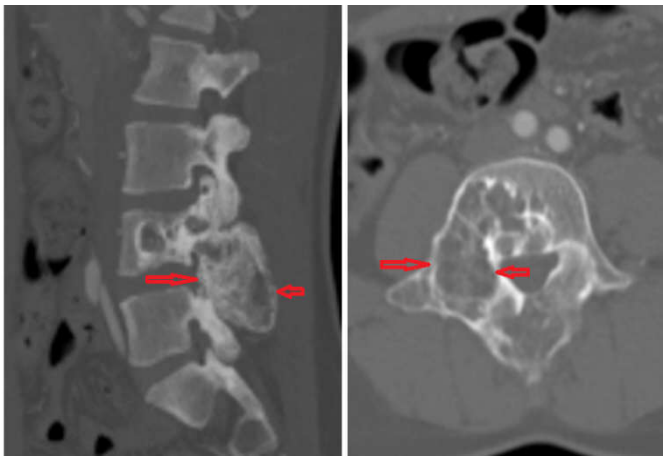

Figure 1. CT Sagittal and axial section showing multiple loculated cyst suggestive of ABC

Case-2 – ARACHANOID CYST

A 22-year-old female came to us with complaints of lower back pain for three years with radiation to left lower limb for past 3 months with history of neurogenic claudication. SLR was positive at 60 degrees. She was evaluated with radiographs and MRI (Figure-2) and diagnosed to have arachanoid cyst in sacral region compressing over nerve roots. She was successfully treated with laminectomy, cyst excision and closure of the dural defect. On last follow up at 12 months she was free of leg pain and follow up MRI did not show any evidence of recurrence of the cyst.

Case -3 – METASTATIC TUMOR

A 62-Year-old man presented to us with complaints of lower back pain for more than ten years with worsening in past six months, he also complains of radiation to left lower limb for one month. SLR was positive at 30 degrees. He was evaluated and found to have metastatic tumor of L5 with compression of cauda equina with liver as primary tumor (Figure-3). He was treated with pre-operative embolization followed by decompression and posterior iliolumbar stabilization. At 12 months follow up he is able to perform his routine activities and under oncological medical management.

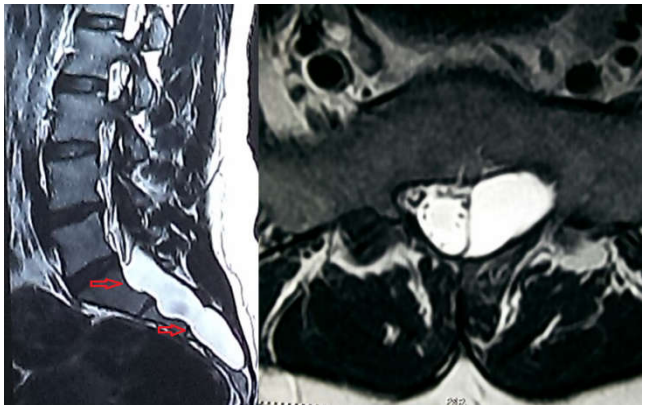

Figure 2. MRI sagittal and axial section showing hyperintense lesion over S1-S3 suggestive of Arachanoid cyst

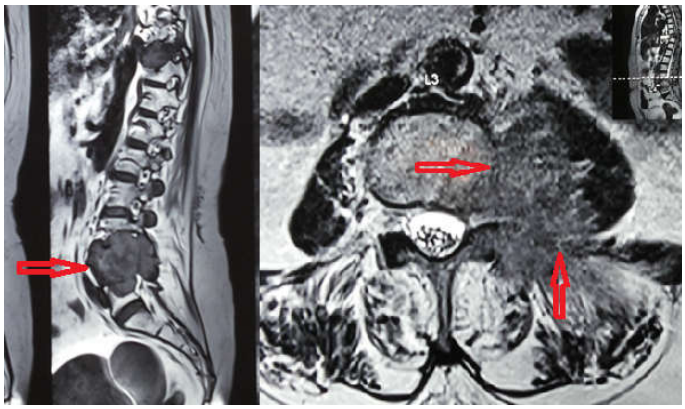

Figure 3. MRI sagittal and axial section showing hypointense lesionnear L4-L5 vertebra suggestive of metastatic tumor

Case-4 – FACETAL CYST

A 52-year old gentleman came to us with complaints of lower back pain for five years with sciatica of left leg for past six months. SLR was positive at 60 degrees. He was evaluated with radiographs and MRI (Figure-4) and found to have facetal cyst compressing over left L5 exiting nerve root. He was managed with analgesics, pregabalin and physiotherapy. He had relief of symptoms for six months and later he developed leg pain with less severity which was further managed conservatively and improved well. At one year of follow up he is asymptomatic.

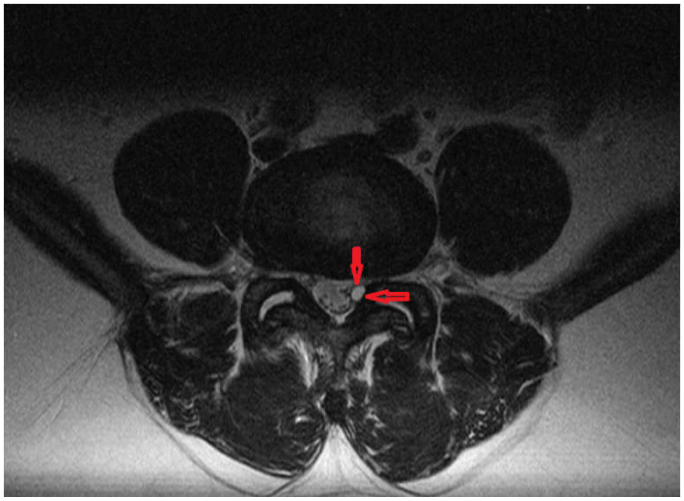

Figure 4. MRI Axial section showing hyperintense small bulge suggestive of Facetal cyst compressing left side nerve root

Case – 5- HEMANGIOPERICYTOMA of Pyriformis muscle

A 53-year-old female referred to us with complaints of generalized weakness with severe bone pain and right leg pain. She had multiple fractures of long bone which was managed with intramedullay nailing earlier. SLR was positive at 45 degrees. She was evaluated and found to have tumor induced osteomalacia with pyriformis tumor compressing over sciatic nerve which was detected on Ga 68 DOTANOC PET/CT scan (Figure-5). Her FGF-23 value was 6500 pg/ml. She was managed with tumor excision and histopathological examination reported as Hemangiopericytoma. She responded well after tumor excision and her FGF-23 value returned to normal level.

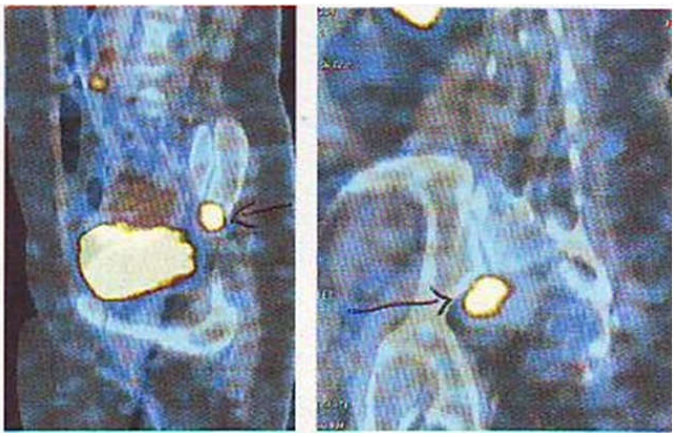

Figure 5. Ga 68 DOTANOC PET/CT scan showing tumor in pyriformis muscle (Diagnosed as Hemangiopericytoma)

Case-6- SCHWANNOMA OF S1 ROOT

A 45-year-old female came to us with complaints of left leg pain associated with lower back pain for past 3 years. SLR was positive at 60 degrees. She was evaluated clinically and by imaging suggestive of neurofibroma of the S1 root (Figure-6). Patient was treated with tumor decompression and iliolumber stabilization and biopsy was reported as schwannoma. She has occasional back pain on exertion but there is no leg pains at last follow up at 15 months.

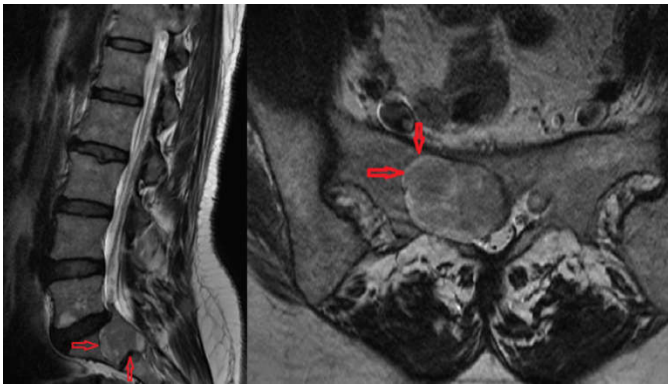

Figure 6. MRI sagittal and axial section showing tumor suggestive of schwannoma of S1 root

Case-7- EPIDURAL ABSCESS

A 60-year-old male with diabetes mellitus referred to us with complaints of lower back pain with severe right leg pain for past two months associated with intermittent fever and stiff back for past two months. He had significant sciatica and SLR was positive at 30 degrees. He was evaluated by MRI and he was diagnosed to have epidural abscess compressing over nerve roots L4 and L5 on the right side. He was managed with drainage and culture grew staphylococcus aureus. Culture sensitive antibiotics were given for six weeks. He responded well to this treatment and remains symptom free at one year follow up.

Case-8- Giant Cell tumour (GCT) of L3 Vertebra

A 24-year-old gentleman came to us with complaints of back pain for past six months with aggravation for past three months and left side leg pain for past three months which is not responding to conservative treatment. His SLR was positive at 60 degrees. On evaluation by imaging and histopathology he was found to have giant cell tumor of L3 vertebra compressing over the nerve root (Figure7). He was managed surgically and responded well to the treatment.

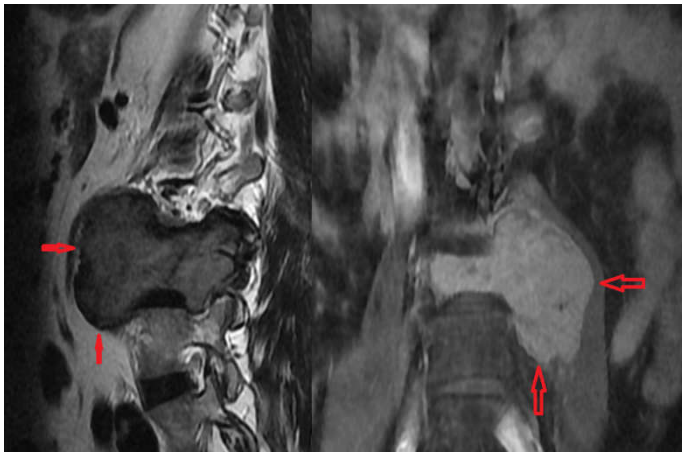

Figure 7. MRI sagittal section T1 and T2 weighted image showing tumor involving L3 vertebra suggestive of GCT

Case-9- PROXIMAL FEMUR CHRONIC OSTEOMYELITIS

A 40 yr old female was referred to us with complaints of right gluteal region pain, right thigh pain and lower back pain for 3 months which was evaluated elsewhere with MRI which had shown multilevel mild disc bulge and treated with pelvic traction for 4 weeks. As there was no relief from symptoms she was referred to us. She had SLR positive at 45 degrees, but also had tenderness over the proximal aspect of anterior thigh. We evaluated her and diagnosed to have chronic osteomyelitis of proximal femur (Figure-8). This was treated with debridement and culture sensitive antibiotics for six weeks. At last follow up at 18 months and she is able to perform her daily and routine activities.

Case -10- LIPOSARCOMA AROUND L3 NERVE ROOT

A 60-year-old man came to us with complaints of abdominal pain, lower back pain for past 8 months with increased in intensity for past 2 months, he also complains of numbness and pain in left leg for past 2 months. SLR was positive at 45 degrees. On evaluation by imaging he was found to have nerve sheath tumor of L3 root on left side (Figure 9), he was managed with excision of tumor which was sent for biopsy. Histopathology was reported as liposarcoma. At last follow up at one year he is free of symptoms.

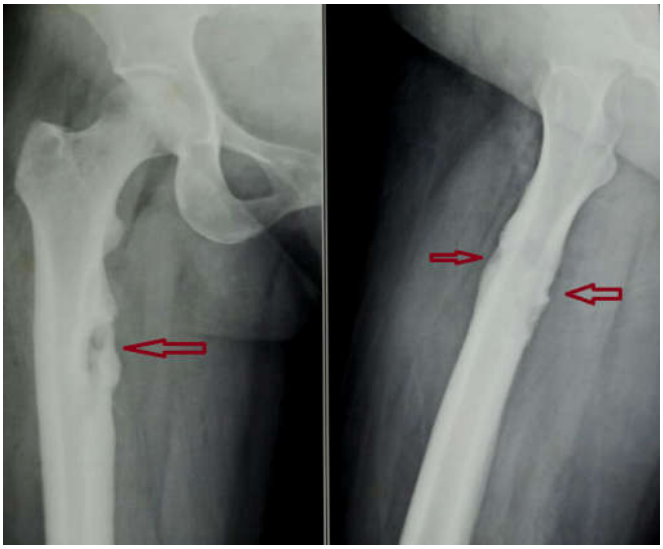

Figure 8. Radiographs of hip with proximal femur showing periosteal reaction, sequesterum suggestive of chronic osteomyelitis

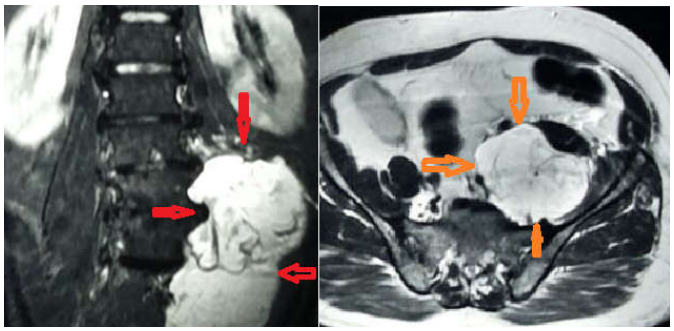

Figure 9. MRI coronal and axial section showinghyperintense lesion suggestive of Liposarcoma

rupture of the medial head of the gastrocnemius, lesions in the sacrum and pelvis, and fracture of the ischial tuberosity (Keith *et al*., 2008). The sacroiliac joint is a common cause of low back pain, but there is hardly any data indicating that sacroiliac joint sciatica can mimic radiating pain due to nerve compression (Fortin, 1994; 1994 and Fortin, 2003). If there are no neurological signs or symptoms in patients with radicular pain syndromes other sources of pain, that is, SI joints, should be taken into account, especially when the pain radiates into the lower leg in an area similar to the dermatomes L5 and S1. SI joint-related pain shows similar patterns. It can refer to the buttocks, thigh, upper and lower leg to the lateral ankle (Fortin, 1994 and Bernard *et al*., 1991).

Explanations for the radiating pattern of pain into the leg due to the SI joint are several. First, it can be interpreted as referred pain from this joint, since pain from deep somatic structures is referred just like visceral pain (Kellgren, 1939).The radiating pattern depends upon the segmental nerve supply of the SI joint, which is described as primarily deriving from branches from L5 to S4 spinal nerves (Grob, 1995).Secondly, it has been reported that radiating SI joint-related pain may also be considered as segmental nerve-related pain because of the close relationship between the ventral capsule of the SI joint and the spinal nerves L5 and S1, just before where these nerves join to form part of the sciatic nerve (Fortin, 1999). There are no specific radiological abnormalities for this syndrome, although CT scan and MRI can be helpful in diagnosing sacroiliitis and joint space narrowing (Ryan, 1983). With clinical suspicion of a SI origin of pain, intra-articular injection is currently the only means to confirm that diagnosis, (Elgafy, 2001) although its validity is questioned (Berthelot, 2006). There are some uncommon causes of sciatica like buttock soft tissue tumor has been reported (Serafin Lirola, 2013).

Table 1. Causes of Sciatica of non discogenic origin

A. G. Filler, *et al* Study	D.G. Kulcu *et al*[7]	Present Study
1. Pyriformis syndrome - 67.8(%)	1. Sciatic neuritis,	1. Aneurysmal bone cyst.
2. Distal foraminal entrapment -6.0(%)	2. Bilateral sacroiliitis, 3. Soft tissue tumor,	2. Proximal femur Osteomyelitis.
3. Ischial tunnel syndrome -4.7(%)	4. Pyriformis syndrome and hamstring tendinopathy,	3. Epidural abscess.
4. No diagnosis -4.2(%)	5. Lumbar disc hernia and Pyriformis syndrome,	4. Hemangiopericytoma
5. Pudendal nerve/sacrospinous ligament -3.0(%)	6. Degenerative lumbar spine and coxarthrosis	5. Neurofibroma.
6. Distal sciatic entrapment -2.1(%)	7. Lumbar radicular herpes zoster,	6. Facetal Cyst.
7. Sciatic tumor -1.7(%)	8. Schwannomatosis,	7. Metastatic Tumor.
8. Lumbosacral plexus entrapment- 1.3(%)	9. Facet syndrome and lumbar disk herniation,	8. Arachanoid Cyst
9. Unappreciated lat disc herniation- 1.3(%)	10. Lumbar instability.	9. GCT of L3 vertebra.
10. Nerve root injury due to spinal op- 1.3(%)		10.Liposarcoma around L4 nerve sheath.
11. Inadequate spinal root decompression -0.8(%)		
12. Lumbar stenosis presenting as sciatica -0.8(%)		
13. Sacroiliac joint inflammation -0.8(%)		
14. Sacral fracture -0.4(%)		
15. Tumour in Lumbosacral plexus -0.4(%)		

DISCUSSION

Most common cause of sciatica is due to nerve root compression (90 % cases), 95 % of these are due to lumber disc herniation, but common diseases that can mimic disc disease include Pyriformis syndrome (Kevork Hopayian, 2010), sacroiliac joint dysfunction (Fortin, 1994 and Bernard *et al*., 1994), arthritis of the hip, osteoporosis with stress fractures, extradural tumors, peripheral neuropathy, Ankylosing spondylitis, multiple myeloma, vascular insufficiency and herpes zoster. Infrequent but reported causes of sciatica, not related to disc hernia, include synovial cysts,

Pyriformis syndrome can be one of the common cause of non discogenic sciatica which may be due to congenital anomalies of the Pyriformis and/or sciatic nerve, acquired abnormalities of the PM and/or sciatic nerve, four features appear to be most common: buttock pain, aggravation of sciatica through sitting, external tenderness over the greater sciatic notch and augmentation of the pain with maneuvers that increase Pyriformis muscle tension. These tests are easy to perform within the usual clinical examination (Kevork Hopayian, 2014). Chan *et al*. (2011), reported a case of sciatica like pain due to cervical cord compression and concluded that sciatica-like leg pain is a rare presentation of cervical cord

compression. This referred pain is known as funicular pain and is due to irritation of the ascending spinothalamic tract. Cervical epidural blocks are successful in identifying the cause of funicular pain. They also emphasized on the role of cervical epidural blocks as a diagnostic tool for funicular pain caused by cord compression.Venugopal D *et al*. (Venugopal, 2014). reported a rare case of sciatica, in an active young man, due to sciatic nerve pressure by pelvic heterotopic ossification (HO).
A.G Filler *et al* (Filler, 2005), reviewed 239 cases of sciatica in which standard diagnosis and treatment failed to effect treatment, they used MR Neurography & interventional MRI to diagnose cause of sciatica in such patients and they revised their diagnosis in 239 patients and treated accordingly (Table-1)D.G. Kulcu *et al*[7] has described the 11 causes of nondiscogenic sciatica in his clinical study and they have divided the nondiscogenic sciatica into extraspinal and intraspinal causes (Table-1). Visser *et al*. 2013 suggested to perform a thorough physical examination of the spine, SI joints, and hips with additional radiological tests to exclude other causes.

Our study has demonstrated some unusual causes of sciatica which are not due to intervertebral disc prolapsed (Table 1). All the patients had varying degrees of positive straight leg raise test.We would like to propose a new terminology of "sciatica mimickers" in patients with sciatica like pain with positive straight leg raise test (SLR), due to non discogenic causes. This term is descriptive of the sciatica like pain due to mechanical compression of the nerve roots due to causes other than due to inter vertebral disc material compressing the nerve roots, resulting in a positive straight leg raise test.Non discogenic causes of sciatica are not uncommon and should always be kept in mind in evaluation of patient with sciatica. These conditions are often misdiagnosed or neglected by practitioners. A detailed history of patient's problems, with more focus on character and nature of pain with detailed physical examination to find out non discogenic causes of sciatica should be performed; imaging studies helps to localize the pathology.

Key Message

All sciatica are not due to discogenic causes, consider other etiologies of leg pain which mimics sciatica. We propose a terminology of "sciatica mimickers" in patients with sciatica like pain with positive straight leg raise test (SLR), due to non discogenic causes.

Conflicts of Interest - Nil

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