Sciatic Entrapment At The Piriformis
"The Forgotten Syndrome"

James Zucherman M.D.
St. Mary's Hospital
San Francisco, California

Marvin Hays M.D.
U.S. Public Health Service Hospital
San Francisco, California

Jerome Piontek M.D.
U.S. Public Health Service Hospital
San Francisco, California

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All of us are unfortunately familiar with the patient who has persistent low back pain and sciatica. We suspect that some of these patients suffer from sciatic nerve compression in the region of the piriformis muscle. This paper is a report of our search for diagnosis and treatment of this condition.

I. Review of the Literature

W. Yeomans[1] reported a relationship between the piriformis muscle and symptoms of sciatica as early as 1928. Frieberg and Vinke[2] continued this line of research by dissection of 14 fresh cadavers, and developed the concept of a surgical approach to the piriformis muscle for relief of sciatica. Thiele[3] demonstrated internal rotation of the extended hip produced pressure on the sciatic nerve from stretching of the piriformis muscle. He concluded that spasm of the piriformis was an important inciting factor and demonstrated relief in three cases by repeated intrapelvic massage. Frieberg[4] has reported thirteen cases of surgical piriformis release with immediate relief in all cases, but with recurrent symptoms in two. He did not specify the period of follow-up, however. In 1947 Robinson[5] described the constellation of signs and symptoms in the "piriformis syndrome" and reported excellent surgical results in two cases with five and six year follow-up. Pace and Nagel[6] described a technique of piriformis injection to treat the "piriformis syndrome" in 45 patients with "satisfactory results". In 1976 Mizuguchi[8] reported 16 cases of surgical release in 14 patients with 85% good or excellent results in short term follow-up. All of these patients had established diagnoses of spinal pathology in addition to sciatic irritation at the piriformis.

II. Anatomic Considerations

The piriformis is innervated by the first and second sacral nerves. It has several intra-pelvic origins including the sacro-iliac joint and sacrotuberous ligament.[2]

The sciatic nerve passes directly anterior over the pelvic piriformis and the two structures leave the pelvis together. Internal rotation of the hip produces pressure on the nerve between the stretched piriformis muscle posteriorly, and the sacrospinous ligament and superior gemellus anteriorly.[3] Because of continuity of the hamstrings to the sacro-tuberous ligament, and thereby to the piriformis muscle, straight leg raising may stretch the piriformis over the sciatic nerve.[2] In 15% of normals, part or all of the sciatic nerve passes through the piriformis muscle.[7]

III. Symptomatology

The sciatic entrapment syndrome may occur with no recognized causative factor. The majority of cases develop secondarily to gluteal trauma, or conditions producing low back pain, sciatica and pain in the posterior hip region. Patients usually complain of low back pain with pain and tenderness over the region of the piriformis muscle. Posterior and posterolateral radiation of pain down the thigh and leg are typical. These symptoms are exacerbated by walking, stooping, and lying on the affected side, while rest often brings temporary abatement of symptoms.

IV. Diagnosis

We believe a patient with an appropriate history must exhibit the following clinical signs before the diagnosis of sciatic entrapment at the piriformis is justified:

1) Tenderness in the region of the lower sacro-iliac joint and sciatic notch.

2) Tenderness and spasm of the piriformis muscle discovered by trans-rectal palpation of the muscle (i.e. positive rectal)

3) Exacerbation of symptoms on internal rotation of the extended hip

4) Weakness and patterned discomfort produced by abduction and external rotation of the extended hip against resistance

5) Significant to complete relief by local anesthetic injection of the involved piriformis muscle without evidence of sciatic nerve block

Electromyography will frequently show neuropathic changes in the ipsilateral sciatic nerve distal to the nerve root level. Nerve root abnormalities do not preclude the syndrome, but may suggest an inciting intraspinal lesion. Likewise, intraspinal pathology on myelogram does not rule out the diagnosis, although, a negative myelogram gives added indication of piriformis compression as the major offender.

V. Case Report

Case No.2 is a 51 year-old Merchant Seaman who fell striking the right gluteal area. Several days subsequently he developed progressive right gluteal and sacro-iliac pain and sciatica. Four weeks later he noted a transient right foot drop after ambulation approximately 50 to 100 yards. He felt some relief of symptoms from rubbing the sciatic notch region. Over the following six months he was treated with physical therapy, anti-inflammatory medications, and epidural steroid injection with little result. The myelogram was normal. EMG suggested peroneal neuropathy distal to the root level and to the superior gluteal nerve. The right piriformis muscle was injected on two occasions resulting in complete temporary relief of symptoms. Right piriformis release revealed a hypertrophic piriformis muscle and extensive sciatic nerve adhesions. Post operatively, the patient had immediate and persistent relief of pain. However, transient foot drop after twenty minutes of ambulation persisted at eight months follow-up.

Four of seven piriformis releases with sciatic neurolysis had eight months to ten year follow-up. All had immediate, lasting relief of pre-operative sciatic gluteal, and hip pain. Three of seven operations had less than eight months follow-up. Two of these have shown marked improvement, and the remaining case has persistent symptoms. It is interesting that this last case represents the only patient who did not receive relief with periformis injection. (Tables 2 & 3)

(TABLE 2)

Cases	Periformis Releases	Results		
		Excellent	Good	Poor
6	7	4	2	1

(TABLE 3)

Patient	Age	Signs & Symptoms	Past History	Laboratory	Operative Findings	Follow-up
1	41 F	Left Trochanteric pain; Notch tenderness	Left trochanteric bursectomy; no trauma; Lupus	No EMG or Myelogram	Dense adhesions of sciatic nerve to piriformis; constriction of nerve at piriformis	Complete relief at 10 years
1	50 F	Rt hip sciatica; Notch tenderness	Rt hip bursectomy; No trauma	No EMG or Myelogram	Adhesions of sciatic nerve to piriformis	Complete relief at 1½ years
2	51 M	Notch tenderness; (+) rectal exam; foot drop with walking; sciatica; Relief from piriformis injection X 2	Trauma to rt. gluteal area	EMG showed peroneal abnormality distal to the superior gluteal nerve; Myelogram WNL	Hypertrophied, short periformis, adhesions of sciatic nerve.	No sciatica; Persistence of foot drop at 7 months
3	62 M	Notch tenderness	No direct trauma	EMG was non-specific	Hypertrophied muscle with sciatic nerve perforating the periformis	No symptoms at 1¼ years.
4	59 M	Notch tenderness; (+) rectal exam; 75% relief from periformis injection	Lt. trochanteric bursectomy	EMG showed peroneal abnormality with normal ERECTOR SPINAE	Adhesions of the sciatic nerve; nerve perforating the periformis	Marked improvement at 1 month.

(TABLE 3) continued

Patient	Age	Signs & Symptoms	Past History	Laboratory	Operative Findings	Follow-up
5	53M	Notch tenderness; (+) rectal exam; Pain on internal and external rotation exams; complete relief with periformis injection X 3	Alcoholic; Trauma to rt gluteal area	EMG showed peroneal abnormality wth normal erector spinae	Adhesions of the sciatic nerve	Marked improvement at 1 month
6	50 M	Notch tenderness; (+) Rectal exam; Pain on internal and external rotation exams; No improvement from periformis injection	No direct trauma	EMG showed L5-S1 root neuropathy	Adhesions of the sciatic nerve	Symptoms recurred at 1 week.

DISCUSSION

Argument as to whether or not there is entrapment of the sciatic nerve at the piriformis has continued since the 1920's. The anatomic realities should convince the skeptic that there is reasonable cause to suspect this pathology. It must be remembered that most if not all cases of sciatic entrapment by the piriformis are secondary to anatomical abnormalities, other primary pathology (especially low back problems) or both. The primary causative problem must be recognized and treated as far as is practical. We believe that if proper steps of differential and confirmatory diagnosis are followed, and if indications for surgery are correctly interpreted, surgical intervention will show evidence of pathology and result in relief of major symptoms.

The literature is lacking in documented long term follow up of cases treated by surgery. The excellent results in four of our cases with reasonably long follow up, convinces us that sciatic entrapment by the piriformis muscle is a definite pathological condition which should be considered in all cases of persistant sciatica.

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