

Epidural fibrosis and the Failed Back Surgery Syndrome: History and physical findings

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Patients who present with recurrent symptoms after surgical intervention aimed at correcting their lumbosacral disease pose a therapeutic challenge. A heterogeneous group of factors may underlie symptom recurrence and formulation of a therapeutic strategy depends on an accurate diagnosis of the patient's underlying problem. In this review, the authors discuss the relevant historical and physical findings in patients with epidural fibrosis and the failed back surgery syndrome. [Neurol Res 1999; 21 Suppl 1: S5-S8]

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INTRODUCTION

The terms peridural or epidural fibrosis refer to the deposition of fibrous tissue in the epidural space. This process is usually caused by prior manipulation of the epidural space, whether by placement of an indwelling epidural catheter¹, or, more commonly, by spinal surgery that involves epidural exploration. While epidural scar formation occurs to some degree in response to all procedures that manipulate the epidural space, most patients do not develop symptomatic complaints from scarring. A minority of patients, however, will develop significant back and/or leg pain from epidural fibrosis. These symptoms presumably result from compression of the neural elements by a fibrous mass or constriction of these structures by scar tissue contraction.

Epidural fibrosis is one of many causes of the 'Failed Back Surgery Syndrome' (FBSS). The latter is a clinical syndrome in which patients have persistent back and/or leg pain after one or more surgical procedure aimed at correcting their lumbosacral disease². The failed back surgery syndrome is a heterogenous entity which may result from incorrect initial diagnosis, poor patient selection, incomplete decompression, decompression of the wrong level, recurrent disc herniation, segmental

spinal instability, facet joint disease, permanent nerve root damage, epidural fibrosis, or arachnoiditis³⁻⁷. Epidural fibrosis has been reported to be the cause of symptoms in 8%–14% of patients with the failed back surgery syndrome^{3,5}.

The patient with epidural fibrosis most commonly presents as a patient with FBSS. Clinical and radiographic evaluation lead to the diagnosis of epidural fibrosis after exclusion of the other potential causes of FBSS. Formulation of a rational therapeutic strategy and the likelihood of success depend on an accurate diagnosis of patients with epidural fibrosis.

CLINICAL HISTORY

Obtaining a detailed history is a critical part of patient evaluation and some authors feel that it may provide more information than the physical examination itself⁸. The history should include a brief list of pre-existing diseases and medication use. The presence of diabetes mellitus should be noted since diabetic mononeuritis multiplex can sometimes be confused with radiculopathy from spinal disease. Intra-pelvic mass lesions such as gynecologic or gastro-intestinal neoplasms may involve the lumbosacral plexus or peripheral nerves and produce leg pain. Endometriosis and nerve entrapment syndromes may also produce leg pain.

The evaluation must include details of the patient's original complaint, physical examination, previous radiographic imaging, and all prior interventions. Pre-

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vious incidents of back trauma should be documented. The efficacy of prior therapy, both surgical and nonsurgical, must be investigated. The patient's level of education, job description, narcotic dependence, and the presence of pending litigation should be explored⁸. The personality profile should be evaluated since psychological factors such as depression and secondary gain may amplify and perpetuate pain⁹. Emotional descriptions which exaggerate the extent of pain should raise suspicion of underlying psychological pathology. Spengler *et al.*¹⁰ noted that elevation of the hysteria or hypochondria scales on the Minnesota Multiphasic Personality Inventory (MMPI) increased the likelihood of an unsatisfactory outcome from therapeutic intervention. Patients who stand to gain economically from their disability have also been found to have a diminished response to therapy¹¹⁻¹⁵.

The sensation of pain is subjective. The patient must be questioned about the location, character and severity of pain and whether it is limited to the back or radiates to either leg. The examiner must document the distribution of pain and determine whether it conforms to an accepted anatomical pattern. Is the pain constant or intermittent? If intermittent, how long does it last and is it associated with an inciting event or relieved by a specific maneuver? Back pain exacerbated by movement may be caused by disc space infection, facet joint disease, or spinal instability. Pain which is increased by forward flexion and relieved by leaning backwards may reflect persistent spinal stenosis.

The efficacy of prior surgery should be determined, since patients with persistent symptoms must be distinguished from those with recurrence. Patients who have had no improvement from prior surgery may have been incorrectly diagnosed, subjected to an inappropriate or incomplete operation, or be a poor surgical candidate because of underlying psychological pathology or anticipated financial gain from disability. Those with recurrent pain should be asked about the duration of the asymptomatic interval and the possibility of re-injury prior to return of symptoms. Temporary relief with return of symptoms days to weeks after intervention may signal infection¹⁶ or pseudomeningocele formation. Pain recurrence months to years after surgery may be due to recurrent disc herniation, facet joint disease, segmental instability, epidural fibrosis, or arachnoiditis.

The clinical features of epidural fibrosis are generally considered to be indistinguishable from those of other causes of the failed back surgery syndrome. However, in a comparison of patients with epidural fibrosis and those with recurrent disc herniation, Jönsson *et al.* found that the fibrosis patients had a shorter asymptomatic period after the initial operation. While recurrent disc patients had an average asymptomatic interval of eight years, 14 of the 18 fibrosis patients were

pain-free for less than one year¹⁷. Night and rest pain were equally common in both groups but recurrent herniation patients were more likely to have pain with coughing and a more limited ability to ambulate than the fibrosis patients.

PHYSICAL EXAMINATION

The physical examination is used to document the degree of neurological involvement, to objectively substantiate claims of weakness or sensory loss, and to determine the degree of physical disability¹⁸. Anatomic localization of the lesion is often illusive since fixed deficits from long-standing neural compression and prior surgery may be superimposed on existing pathology. Accurate disability determination is important since many individuals will be in litigation for monetary compensation or have pending disability claims at work. The extent of disability before and after intervention will also be used to measure the efficacy of treatment. As expected, discrepancy between the degree of claimed vocational disability and the functional performance on examination is not unusual.

The examination should be orderly and thorough. The patient should be observed as he enters and leaves the office. The patient's disposition during examination and his response to physical manipulation should be noted. Inappropriate groans and exaggerated gestures should alert the clinician to the possibility of underlying psychological pathology¹⁹. The character of gait and the ease of movement should be noted. Some patients will prefer to stand since sitting may exacerbate their pain. The back should be inspected for the normal thoracic and lumbar curvature and for the presence of scoliosis. The back and sacro-iliac joints are palpated for point tenderness and the degree of paravertebral muscle spasm is assessed. The range of motion (ROM) of the lumbar spine should be determined. Although this maneuver has no proven prognostic value¹⁸, many insurers will require the ROM information as part of the disability evaluation. Prior incisions should be inspected since poor approximation of the lumbar fascia may occasionally cause point tenderness and local pain with movement. The posterior tibial and dorsalis pedis pulses are palpated and the leg is inspected for the stigmata of arterial insufficiency such as atrophic, shiny skin, hair loss or ulceration. The hip joints should also be examined by internal and external rotation with the patient supine and the knee and hip flexed since some patients may confuse hip pain with back or proximal thigh pain.

The presence of lower extremity muscle wasting or fasciculation should be documented. The straight-leg raising test should be performed and the results noted. The test is positive in the majority of patients with disc herniation^{20,21} and, reportedly, is more commonly seen in patients with disc re-herniation than those with

epidural fibrosis¹⁷. While evaluating the motor strength, several factors should be kept in mind:

1. Many muscle groups receive multilevel innervation and single level or limited multilevel disease may cause considerable pain without significant motor weakness.
2. Because of the size and power of the lower extremity musculature, modest diminution in strength may be difficult to appreciate. Weakness is most easily demonstrated by active maneuvers like toe and heel walking, or rising from a seated position.
3. Pain with movement may limit the patient's activity and decrease his effort and cooperation during examination. This may be misinterpreted as weakness by the patient and limit the usefulness of the examination for the physician.

The reflex examination is performed and documented. The findings may be difficult to interpret since they will reflect long-standing fixed deficits as well as ongoing disease. Jonsson noted that reduced or abolished patellar reflexes were found in 12% of patients with recurrent disc herniation and 22% of those with epidural fibrosis. The ankle reflex was equally diminished in both patient groups¹⁷. The sensory examination should also be documented. All modalities should be tested including pin prick, light touch, joint position and vibratory sense. Findings should be checked against known anatomical patterns and regions of discrepancy should be repeated in order to assure accuracy. There are no known sensory deficits which distinguish patients with epidural fibrosis.

SUMMARY

Successful treatment of patients with the failed back surgery syndrome requires that a correct diagnosis of the underlying process be made prior to further intervention³. Surgery may benefit patients with recurrent disc herniation, segmental instability, or spinal stenosis, but patients with epidural fibrosis are less likely to obtain a satisfactory outcome from surgical intervention⁴. While it is important to recognize patients with epidural fibrosis before institution of invasive therapy, there are few physical findings which distinguish these patients on examination. Jönsson *et al.* noted that patients with epidural fibrosis were less likely to have pain with coughing, had less restriction with ambulation and were less likely to have pain with straight leg raise less than 30 degrees than those with recurrent disc herniation¹⁷.

Radiographic imaging provides the most objective information with which to diagnose epidural fibrosis or

any of the other causes of FBSS. Although myelography and post-myelogram CT^{21,22} remain valuable studies in select patients, MRI has emerged as the diagnostic test of choice in this realm²³⁻²⁷.

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