Failed Back Syndrome: A Strategy to Salvage

Young K. Choi, M.D.

Director, New Jersey Pain Institute, Robert Wood Johnson Medical School, U.S.A.

만성 불치 요통: 최신 치료 대책

미국 로버트 우드 존슨의과대학 뉴저지 통증연구원

최 영 국

CASE

A 38 year old male patient presented with chronic intractable pain in low back radiating to both buttocks and posterior legs since 5 years ago. The pain is constant sharp shooting in nature, with numbness and paresthesia.

Patient underwent two times of laminectomies at right L4/5 and L5/S1 and spinal fusion lately, however the pain became worse. Patient tried all kinds of medications, epidural blocks, TENS, acupuncture, and physiotherapy without benefits. MRI showed degenerative changes and EMG showed right L4/5 radiculopathy. PE revealed diffuse tenderness in lumbar area and SLR was negative.

INTRODUCTION

Low back pain is a major public health problem in the US. 50 million Americans are partially or totally disabled by low back pain and over $25 billion are spent each year to treat this condition[1]. However, the total costs spending for the whole problems including disabilities seem much higher. Backache is the second most common reason for patients to visit physicians' office and to take the time off from work[2].

Failed back syndrome is a chronic intractable pain problem resulted from failure of medical and/or surgical treatments (Failed Back Surgery syndrome). It is one of the most difficult therapeutic challenge due to its complex of chronic illness consisted of physical and psychological components.

In most of the cases the patients are dumped or sent to pain clinic as the last resorts. It is a dilemma whether or not to take them as suitable candidates for the pain clinic protocols because they have already tried and failed all kinds of treatment modalities available in the medical field. And the fact that the proposed treatments do not provide any considerable improvement after all will harass them to further psychological implications, even to suicide.

Is failed back syndrome really salvable by using traditional or interventional techniques. If not, do we have any alternatives to help these patients or just give it up? Since failed back syndrome is a complicated chronic illness and multi-factorial, it is imperative to

understand the underlying structure and to approach in a comprehensive way to achieve the optimal pain management.

1) Pain structure of chronic pain illness

The general problems of chronic pain syndrome are based on the nature of psychological and physical derangements. Physical nociception usually incurs the psychological stress to develop chronic pain disease(Table 1).

Primary nociception is commonly masked by secondary hyperalgesia developed from central neural mechanisms such as sensitization, reflex mechanism and hyperexcitation of neural systems. Pain character changes depending on the magnitude of mechanisms and systems involved, including myofascial, skeletal, arthral, and neural systems.

Pain becomes more diffused in distribution and may spread far beyond the initial area to the whole body with the progression of the pain disease. Pain also shows various features such as achy, dull or sharp, stabbing, throbbing, burning or lancinating pain, allodynia, hyperpathia, paresthesia and numbness[3~5].

Pre-existing anatomical pathology or post-surgical complication can cause irreversible changes of neural structure and it may ensue one of the most difficult neuropathic pain problems.

Table 1. Pain Structure of Failed Back Syndrome

A. Physical component:
1) Primary nociception
2) Secondary nociception
3) Disuse atrophy
B. Psychological component:
1) Personality
2) Affect
3) Pain behavior

Chronic disuse of adjacent structures due to splinting of the affected area and pain behavior cause more vicious circle of nociception, which may result in permanent disability subsequently.

Most of these patients have significant pain behavior with negativity, hypochondriasis and depression[6,7]. They do not show ultimate motivation for the treatments. They do not cooperate well with pain caregiver and frequently fail to pursue the treatments plan. They tend to depend on analgesic medications even though there is only a minimal or almost no benefit instead of trying invasive and intensive ways and drug dependence can be instituted.

It is not easy to obtain meticulous information of history and symptom changes with the progression of pain disease because of their painful memory and pain behavior. It is difficult to perform accurate physical examination as well. Doubtlessly insufficient information may lead to misdiagnosis.

Other problems complicated with this chronic illness are drug addiction, legal suits and secondary gain issues.

2) Etiologic factors

Etiology of failed back syndrome is variable.

Common causes are inadequate diagnosis and management of acute back pain, which lead to chronic pain process. Poor patient selection for the surgery and technical errors from surgical procedure are not uncommon

Table 2. Etiologic Factors

1) Inadequate diagnosis
2) Inaccurate management
3) Poor surgical selection
4) Surgical complication

(Table 2).

(1) Inadequate diagnosis and management: Complete evaluation of low backache is crucial to establish adequate treatment plan. It is important to focus on the primary origin of problems. Missed primary nociception can be remained as a persistent source of pain. Misdiagnosis usually ends up with inadequate management and this incurs further psychological implication. One of the mistakes easily made is utilizing unimodality pain treatment for multi-facet problems. And this eventually causes missing optimal time sequence of treatments and leads to irreversible neural tissue damage.

(2) Poor patient selection for surgery: Burton et al[8,9] reported that the most common primary factor leading to failed back surgery syndrome is lateral spinal stenosis. The other factors are central stenosis, recurrent or persistent herniation, arachnoiditis, and the wrong surgery.

Careful evaluation and studies before the surgery should justify the necessity of surgery. Repeated failed back surgery causes not only anatomical distortion, but psychological stress such as frustration, anger, hopelessness, and depression.

(3) Surgical complication: Technical errors from surgical procedure account less than 5% of the primary factors causing failed back syndrome. Epidural fibrosis is the most common complication after the surgery. Hematoma and extensive manipulation may give chance to make scar tissue around the nerve root in the epidural space. Nerve injury during surgery can cause temporary or permanent radiculitis, neuroma or perineural fibrosis. Foreign body also can be a source of infection, abscess and resultant fibrosis. Surgery on the wrong site is another cause of failed results[10].

3) Symptomatology

Pain is originated from musculo-skeletal, tendo-ligamental, arthral, and neural systems and shows every characters of them, such as motion related deep achy, sharp, shooting, stabbing, throbbing, burning pain, allodynia, hyperpathia, numbness or paresthesia.

Pain is constant but shoots up intermittently. Position or motion aggravates the pain in various intensity according to its origin.

Most vulnerable area of the spine causing failed back syndrome is located in L4/5 and L5/S1 due to its anatomical differences and the body mechanics. Pain resides in lower back area unilaterally or bilaterally radiating to L4, L5 and S1 dermatomal, myotomal, and sclerotomal distribution.

It shows neuropathic symptoms depending on the magnitude of direct effect on nerve roots, such as mild to severe radiculitis. Significant spinal nerve entrapment will show radiculopathic pain going to the involved toes (Table 3).

Intra-spinal, Extra-spinal or both origins show different pain such as superficial, deep, or referred.

Patient may show depression, flat affect, hostility, anger, emotional swing with easy crying, anxiety or even panic attacks depending on their psychological status. Some patients may be paranoid as well.

4) Diagnosis

Diagnosis for the etiology of failed back syndrome is warranted by detailed investigation of the history and complete medical examination with neurological tests. It is important to know the following information to determine the primary or secondary nociception

Table 3. Differentiation of Pain

A. Type of pain:
1) Superficial pain- myofascia, tendo-ligament
2) Deep pain- bone, joint
3) Referred pain- nerve

B. Characters of pain:
1) Myofascial pain- dull, achy, burning, sore, paresthetic, numb or hyperesthetic, or stiff
2) Tendo-ligamental pain- sharp, achy, throbbing, shooting, burning, sore, gnawing or hyperalgesic
3) Arthral and osteogenic pain- dull, achy, gnawing, burning, and sharp shooting at times
4) Neurogenic pain- sharp, shooting, lancinating, burning, paresthetic, numb, allodynic, and hyperpathic

C. Distribution pattern of pain:
1) Dermatomal
2) Myotomal
3) Sclerotomal
4) Radicular
5) Peripheral neural
6) non-specific

Table 4. Origins of Pain

A) Intra-spinal causes:
1) Degenerative disease of disc, spinal bone, facet joint, ligamentum flavum and sacro-iliac joint
2) Spinal stenosis- central, lateral or foraminal
3) Disc herniation- recurrent or persistent
4) Spondylosis and spondylolisthesis
5) Spinal body fracture
6) Lateral spinal nerve root entrapment
7) Epidural fibrosis
8) Arachnoiditis

B) Extra-spinal causes:
1) Myofascial syndrome
2) Tendo-ligamentitis
3) Facet syndrome- anterior, posterior or arthral
4) Sacro-iliac syndrome- anterior, posterior or arthral

as well as pain mechanisms.

(1) Pain characters and change- location, radiation, quality, and associated symptoms

(2) Accelerating or decelerating factors of pain

(3) Use of pain medication and its response

(4) Sleep patterns relevant to pain

(5) Use of modalities and its response

Intra-spinal as well as extra-spinal origins should be sought thoroughly. Most of the patients with failed back syndrome have both intra-spinal and extra-spinal causes.

Chronic mechanical syndrome from extra-spinal origins can be often confused as intra-spinal radiculopathy due to its nature of disease process, left undiagnosed and under-treated[11~16](Table 4).

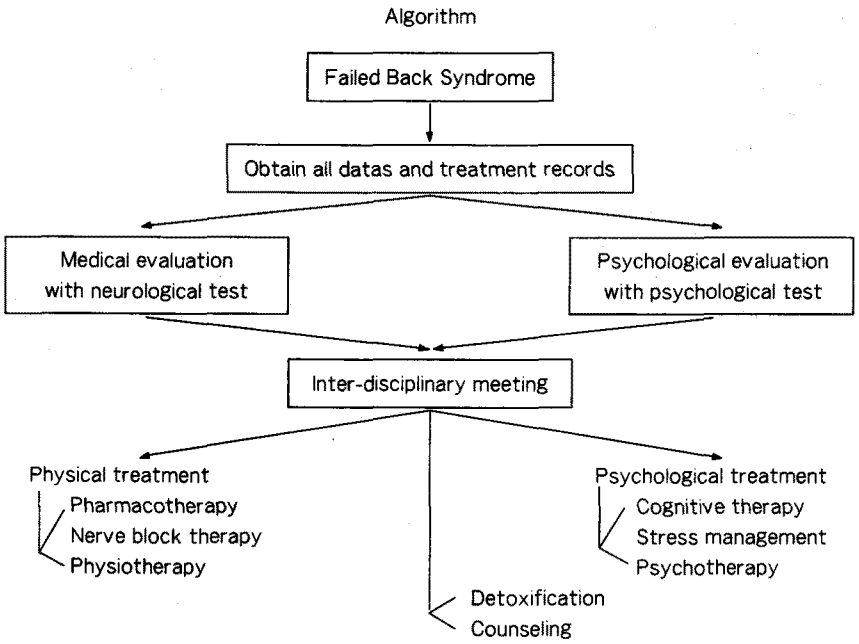
Interestingly extra-spinal origin of pain is predominant in over 90% of patients with failed back syndrome referred to the New Jersey Pain Institute.

MRI, CT-Scan and myelogram are helpful to support the diagnosis. However they are not valuable clinically in most cases. EMG & nerve conduction study or evoked potential nerve test are also supportive for the differentiation of neurogenic component.

5) Strategy to salvage

A protocol should be developed to manage this complicated chronic pain disease appropriately. The goal is to manage the pain optimally to help resuming normal functioanl activity daily with reduced pain and disability, reduced intake of centrally acting medications and analgesics, and providing better quality of life. The main strategies are as followings;

(1) It is important to analyze the underlying structure of pain and know each origins of pain, primary and secondary site of nociception and concurrent psychological status.



Elimination of every etiologic factor helps to accomplish optimal relief.

(2) Multi-disciplinary approach is the main key due to its multi-factorial problems. Single modality treatment provides only partial effects and pain recurs back shortly. Complete resolution of underlying problems can provide optimal relief of pain and prevent the recurrence.

(3) Psychologic measurement should be applied aggressively and psychiatric consultation is inevitable if patient shows significant psychiatric symptoms, emotional instability or suicidal tendency.

(4) Intensive and innovative anti-nociceptive modalities should be applied as indicated for every etiologic origin and mechanism of pain developed.

(5) Comprehensive pain team consisted of algologist, psychologist, pain nurse, coordinator, physiotherapist, social worker and counselor works more efficiently.

Organized pain team makes frequent inter-disciplinary meeting to discuss the patients' status and future plan.

6) Multidisciplinary pain management

Multidisciplinary treatment including pharmacological therapy, nerve block therapy, psychological therapy and physical therapy approach each aspect of problems[17~20].

(1) Physical management:

① Anti-nociceptive measurement:

a) Neuro-depressive therapy:
- Nerve block therapy
- Neurolysis
- Intra-spinal opioids

b) Neuro-augmentative therapy:
- TENS
- PENS
- Spinal cord stimulation

② Pharmacologic measurement:
- Antiinflammatory medication
- Antidepressants
- Anticonvulsants
- Muscle relaxants

Sedative-hypnotics
Opioids

③ **Physiotherapy and rehabilitation:**
Thermotherapy
Cryotherapy
Mechanotherapy:
Massage
Exercise
Aquarobics
Work-hardening program
Occupational therapy

(2) Psychological management:

① **Psychological testing**

② **Psychological therapy:**
Cognitive behavioral therapy
Relaxation therapy
Biofeedback
Hypnotherapy
Psychotherapy
Counseling
Detoxification

CONCLUSION

Failed back syndrome is a chronic disease state from physical and psychological dysfunction. Comprehensive team effort with multidisciplinary approach may warrant a successful pain management.

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