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FAILED BACK SURGERY SYNDROME

BAŞARISIZ BEL CERRAHISI SENDROMU

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ABSTRACT:

Failed back surgery syndrome (FBSS) is a chronic pain condition after one or more spine surgery. Despite advances in surgical technology, the rates of failed back surgery have not declined.This conditions are may occur in the preoperative, intraoperative, and postoperative periods. Furthermore, it is likely that multiple factors (biological, psychological, and social) are involved with the development of the pain process, necessitating an interdisciplinary approach to management. Neurosurgeons, physiotherapist, algologiest, orthopedic surgeons and radiologists are necessary to evaluate these patients as a multidisciplinary team. FBSS is a common and significant social and economic burden and lead to greater economic and physical losses compared with other chronic low back pain.

Key words: Failed back surgery syndrome, Chronic low back pain, Low back pain management

Level of evidence: Review article, Level V

ÖZET:

Başarısız bel cerrahisi sendromu bir veya daha fazla omurga cerrahisi geçirdiği halde geçmeyen kronik ağrı durumudur. Cerrahi teknolojilerin gelişmesine rağmen başarısız bel cerrahisi oranı azalmamıştır.Ağrının oluşmasında birçok faktör(biyolojik, psikolojik ve sosyal) rol almakta ve çoklu disiplinyaklaşımı yönetimde tercih edilmelidir. Bu multidisipliner yaklaşımda beyin cerrahı, fizyoterapist, algolog, ortopedist ve radyologların birlikte çalışmalarına ihtiyaç vardır. Başarısız bel cerrahisi sendromu diğer bel ağrısı sebeplerine göre sosyal ve ekonomik yönden daha büyük kayıplara neden olmaktadır.

Anahtar kelimeler: Başarısız bel cerrahisi sendromu, Kronik bel ağrısı, Bel ağrısı yönetimi

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INTRODUCTION:

Failed back surgery syndrome (FBSS) occurs following one or more previous spinal surgeries, persistent or recurring chronic low back pain syndrome with radiculopathy or without radiculopathy. The increase in the rate of low back pain due to failed back surgery is parallel to the increase in the number of spinal surgery in recent years. The incidence of patients that will develop FBSS following lumbar spinal surgery is commonly quoted in the range of 10 % to 40% [13,14,17,27].

FBSS with the proportion of patients varies according to the approach of surgeons in many countries. FBSS is difficult to compare rates because of differences in pain scores[4]. When compared with other surgical procedures performed for nonlife-threatening conditions success rates for spinal surgery are poor. Age range have not been detected in patients with FBSS but women are apart as the gender ratio[9].

The annual cost for medical therapy for patients with FBSS, excluding further surgery or implantation of a spinal cord stimulator or intrathecal pump, is estimated to be $18,883 per patient in the United States[6]. FBSS is a common and significant social and economic burden and lead to greater economic and physical losses compared with other chronic low back pain. The importance of prevention and potential methods by which to achieve this will be discussed.

ETIOLOGY:

It has been found that a strong predictive value of preoperative psychological conditions like anxiety and depression[3]. However, itself chronic pain, anxiety disorder, and should even be noted that cause depression. Litigation and workers' compensation, has an important place. More than 4 revision surgery patients spend 50 % more at risk for spinal instability. Repeated surgery is associated with reduced success rates[15].

Perioperative factors are; inadequate intake of lateral recess, the screw malposition, Incorrect level of surgery, inability to achieve the aim of surgery. Posteratif period, the patients are from recent disc herniation, spondylolisthesis, epidural fibrosis (tethering effect, jeopardizing nutrition, and vascular supply to nerve root), surgical complications (e.g., nerve injury, infection, and hematoma) and myofascial pain development causes pain. Missed level as in case of segmentation abnormalities or marked obesity, failure to perform adequate decompression as in misdiagnosis of canal stenosis during discectomy, conjoined nerve root or missed disc fragment and far lateral disc[18]. Epidural fibrosis, arachnoiditis are the most common causes of pain in long term period. Between 6% and 8% of patients in the epidural fibrosis, arachnoiditis is seen in 16 to 12% [26]. Foraminal stenosis in FBSS is structurally the most common cause. Due to loss of disc height range "up - down" as it may be stenosis depending on the formation of osteophytes facet hypertrophy and "front-to-rear stenosis" it can also be seen[20].

After discectomy and laminectomy instability frequency can be up to 18 %. Fusion of transition zon can cause syndrome. Degenerative changes in other words the level of fusion adjacent motion segments can be seen. Fusion of failure is the most common complication rates of 5-40% with pseudoarthrosis development. In patients with intervertebral fusion cages, it is difficult to prove that the union. To improve the pain for 6 months after surgery, the preoperative deterioration of foraminal stenosis and radiolucent appearance key around the cage. After spinal fusion with pedicle screw sudden leg pain can be caused by screws[20]. When postoperative pain after a period of pain or a new pain occurs when the patient and physician repeat as wrong to evaluate it as the FBSS.

In patients with late stage the emergence of a new pathological symptoms is usually different from the reasons mentioned first operation. In this group, before connecting operations have undergone the cause of complaints should be investigated whether a new pathology. Sometimes, underlying diseases such as osteoarthritis, patients, depending on the speed of this process depends on the progression of a disease or surgery may become symptomatic.

DIAGNOSIS:

Diagnosis of chronic low back pain is multifactorial causes It can be difficult. FBSS is more difficult to diagnose. .Because non-organic factors can also cause pain. Should be a detailed history and a thorough physical examination should be performed. Many schemes have been developed to classify failed back surgery syndrome[2].

History, on the road to diagnosis is very important. Symptoms should be known well before surgery and how it is applied in a surgical subject it is a different importance. The patient's pain, what should be questioned to occur until after the surgery. Only if there is pain in the lumbar region and whether it is accompanied by radiculopathy in addition to a different importance psychosocial status of the patient should be decisive information. The level of satisfaction regarding the business, financial gain low level of education, should be questioned whether the heavy workload. secondary gain issues must be clarified. If the patient's trigger point is palpated it is determined. Muscle weakness in the preoperative and postoperative, should be carefully examined and should be noted. Smoking patients must be questioned. For determination of patients with instability in flexion-extension radiographs can be quite valuable.

In FBSS patients; leukocyte count, erythrocyte sedimentation rate, CRP, procalcitonine and other inflammatory markers, should be examined. Performed by diagnostic injections; facet,

sacroiliac, radiculopathy may be distinguished. Minnesota Multiphasic Personality Inventory test, although not FBSS had a specific test can be used in case of suspicion[25].

In addition, instrument dysfunction, pseudoarthrosis, fractures and dislocation also recognizable in direct radiography. In cases where there is insufficient direct radiography, computed tomography moderate cost, helps as a non-invasive test. Epidural fibrosis, infection, disc herniation, pseudomeningocele, arachnoiditis, spinal stenosis, foraminal stenosis and neoplastic conditions must also be selected modality magnetic resonance imaging (MRI). In terms of diagnostic nuclear medicine modalities to help it is limited. 2 years after an operation conducted fusion, still it may be interpreted as increased involvement pseudoarthrosis matter if localized[10].

CONSERVATIVE TREATMENT:

FBSS treatment remains a challenge for pain medicine and the criteria for operating in cases of persistent pain are less clear. There are some conservative treatment modalities (Table-1) before giving surgery decision. It has been demonstrated that sciatica improves within 3 months with conservative medical management in 75 % of patients[23].

Table-1. Conservative Treatments for FBSS

Conservative Treatments for FBSS
Pharmacological: _ Acetaminophen _ Nonsteroidal anti-inflammatory drugs _ Cyclooxygenase-2 inhibitors _ Tramadol _ Muscle relaxants _ Antidepressants _ Gabapentinoids _ Opioids
Physical: _ Exercise therapy/physical therapy _ Spinal manipulation (chiropractor) _ Massage _ Acupuncture _ Transcutaneous electrical nerve stimulation
Psychological therapy and educational: _ Cognitive behavioral/rehabilitative therapy

There were several studies with pharmacological trials in FBSS. With regards to opioids, there appears to be an initial impact on pain intensity but over time this improvement diminishes and doses appear to escalate, furthermore no positive impact on function or other measures health status occur[7]. Multi-modal analgesia does appear to be of benefit, however specific agents that demonstrate efficacy are challenging to identify, essentially, it remains difficult to isolate the appropriate agents that should make up this cocktail. Gabapentinoids may be limited by loss of effect and better understanding their role and importance in a poly-analgesic approach[8]. The role of local anesthetics is limited based on the data. Myelo-relaxants is not well elucidated in the literature. Although limited cases series demonstrate improvement in patients receiving vitamin D supplementation, it remains unclear whether this is efficacious in treating underlying relative hypovitaminosis or directly in the treatment of FBSS [24].

Rehabilitative outcomes are difficult to assess, as they appear successful as a part of an overall interdisciplinary point of view[11]. There is a dearth of well-delineated, targeted dynamic protocols in the literature, most studies fail to describe key elements of the rehabilitative approach in favor of generic terminology, however, the benefits of rehabilitation may not be limited to improved pain scores and may extend to functional improvement and self perceived health status and mood[7]. Alternative therapies, such as chiropractic, manipulation and laser acupuncture currently do not have enough supportive literature to endorse their use.

Cognitive/behavioral therapy (CBT) is broadly defined as interventions that apply psychological principles to change the overt behavior, thoughts, or feelings of persons with chronic pain to help them experience less distress and enjoy more satisfying and productive daily lives[7]. The concept of CBT was originally pro-posed to explain the continuation of a depressed mood state, which resulted from the triad of negative views about oneself, the world and the future.

MINIMAL INVASIVE METHODS:

Determining when to operate on a back pain patient is a major point of contention in the scientific literature. The problem must be aware of the epidemiology of biological and psychological. Treatment for failed back surgery syndrome should be tailored to each patient. It is clearly indicated in those suffering from progressive motor loss or cauda equina syndrome, but in less severe cases the decision process can be difficult[19]. The general consensus in surgical circles is to allow minimal invasive treatment modalities (Table-2) prior to even considering invasive surgery.

To investigate leg pain or low back and leg pain associated with or without FBSS, transforaminal root sleeve injections, lumbar sympathetic blocks and spinal cord stimulation testing may be essential diagnostic tools and frequently determine the treatment. It has also been shown that patients who failed to obtain sustained relief of radicular pain following the block were less likely to benefit from subsequent surgical intervention[21]. Therapeutic approaches to leg pain are closely related to their underlying mechanism. Leg pain arising for low back pathology can be either inflammatory or neuropathic.

Table-2. Minimal Invasive Techniques for FBSS

Minimal Invasive Techniques for FBSS
Selective nerve root blocks
Lumbar provocation discography
Lumbar facet joint nerve blocks
Sacroiliac intraarticular injections
Caudal, interlaminar, and transforaminal epidural injections
Therapeutic facet joint conventional radiofrequency and pulsed radiofrequency
Conventional radiofrequency neurotomy
Lumbar percutaneous adhesiolysis, epiduroscopy
Intradiscal electrothermal therapy and biaculoplasty
automated percutaneous lumbar discectomy
percutaneous lumbar laser disc decompression
nucleoplasty

Epidural steroid injection is probably the most frequent procedure performed to treat radicular pain. Technique is simple, and safe. Neurological damage after the procedure, infection may occur. Epidural steroid injections are done studies showing that bone mineral density worsen. transforaminal, interlaminar or caudal epidural spaces are applicable. The current literature provides moderate evidence of transforaminal epidural injections in the preoperative evaluation of patients with negative or non-conclusive imaging studies, but with clinical findings of root irritation.

For chronic low back pain without disc herniation or radiculitis, the precision diagnostic blocks applied include lumbar facet joint nerve blocks, lumbar provocation discography, and sacroiliac joint blocks, and to a lesser extent, lumbosacral selective nerve root blocks or transforaminal epidural injections in the diagnosis of difficult radicular pain syndromes. FBSS is treated based on diagnosis with various modalities including epidural injections, percutaneous adhesiolysis, intradiscal therapy or annular thermal therapy, and mechanical disc decompression for disc-related pain, either discogenic or secondary to disc herniation, radiculitis, spinal stenosis, or post surgery syndrome. Facet joint interventions and sacroiliac joint interventions are utilized in managing facet joint and sacroiliac joint pain.

SURGICAL TREATMENT:

The low back pain population includes a wide variety of patients. Not all patients should go through such diagnostic processes and treatments (Table-3). Invasive treatment will be required for only a small portion of these patients.

Table-3. Surgical Treatments for FBSS

Surgical Treatments for FBSS
Spinal cord stimulation
Intrathecal drug delivery systems
Revision surgery

Spinal cord stimulation (SCS) with a low voltage electric current supplied to the spinal cord is intended to block pain signals to the brain is one of the most popular procedures for pain in recent years.. At the end of the trial period of 3 weeks after the electrodes attached to the patient; Contact the extent to which complaints, changes in analgesic treatment needs, the impact of pain on sleep patterns, changes in everyday life capacity is questioned[22]. Studies have shown that, when performed with appropriate indications and accurate surgical technique, FBSS patients with decreased pain, as a significant rise in the functional capacity was shown to be the most significant advantages of conventional medical therapy[12].

The argument that electrical stimulation of large fibers would close the gate to input from the smaller diameter and unmyelinated A-delta and C fibers mediating pain was determinant to the success of SCS. Another aspect to be emphasized stimulation of the spinal cord; protection of patients is repeated surgical procedures.

Considering that SCS is an end stage technique used in patients in whom everything has failed, SCS is an effective treatment, particularly considering the low complication rate[16]. SCS; as an effective pain relieving treatment for chronic back and leg pain in patients with or without a prior history of back surgery and presenting as predominantly leg pain. Randomized controlled trials are needed to confirm the effectiveness and cost-effectiveness of SCS in the chronic back and leg pain population with predominant low back pain and examine patient and technology-related factors that may be predictive of SCS success[22].

In the current state of evidence, intrathecal infusion devices can only be recommended in patients where all other viable options have failed. Patients for this mode of analgesia should have undergone all medically appropriate treatments, including oral opioid therapy with dose escalation[5]. If the patient experiences inadequate analgesia or intolerable side effects, they may be a candidate for a trial of intrathecal administration. It is important that the patient experiences an analgesic response to opioids as opioid resistant pain is unlikely to respond to intrathecal administration[6]. Patients should undergo psychological evaluation before implantation[5]. After these criteria are satisfied, then a trial may be initiated. If there is a positive response to the trial, then implantation of the intrathecal pump may then be performed.

In the absence of high-quality trials to guide us, the decision for further surgery is similar to indications for the index surgery[2]. If there is any significant major neurologic deficit amenable to surgery, then surgery should proceed. In the case of FBSS, if there is evidence that increased pain is due to problems with hardware, such as a pedicle screw impinging on a nerve root, corrective surgery would be indicated[1]. The decision to reoperate in the remaining cases with ongoing pain is difficult. However, a small prospective study suggests that with proper patient selection, correct diagnosis, and indicated surgical procedure targeted at the pain generator, successful outcome as measured by > 50% pain reduction and reduction in Oswestry Disability Questionnaire score is in the region of 90 %[5,8].

The management of FBSS is challenging. After reviewing the indication and technical aspects of the original surgery, the lesion that was treated surgically may not have been the cause of the patient's pain. An intensive work-up is needed to detect the source of the residual pain. Additional intervention may be justified in the case of pathology amenable to surgical correction. Fusion must be performed strictly because previous surgery failed, and should not be systematically considered after failed decompressive procedures. Finally, surgeons should collaborate with pain physicians in the management of patients with FBSS.

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