

Section 4. Medical science

Hakobyan Arman Pargevi,
Central Clinical Military Hospital of RA,
PhD in medical science, Department of Neurosurgery
E-mail: neuroarman@yahoo.com

Posoperative pain treatment with epidural injection after lumbar disc surgery

Abstract: About 30% of patients feel pain after spine surgery. This recurrent pain is result of nerve root swelling. The selective nerve root blockade under RX-control with steroid injection was performed with high efficiency.

Keywords: recurrent radicular pain, spine surgery, nerve root swelling, epidural steroid injection.

Introduction

About 200,000 lumbar laminectomy and discectomy surgeries are performed every year in the United States. Approximately 90 % of these surgeries will result in a good outcome. For the remaining 10 % of patients who do not do well after spine surgery, the search for a solution to their continued pain begins with an assessment of the likely cause of that back pain or leg pain. The formation of scar tissue near the nerve root is a common occurrence after back surgery. For this reason, the importance of scar tissue (epidural fibrosis) as a potential cause of postoperative pain is commonly called failed back surgery syndrome. The 80,000 patients a year who continue to have chronic, disabling back pain after one or more spinal surgeries are said to have failed back surgery syndrome. Most Common Causes of Failed Back Surgery is Foraminal stenosis 25 %–29 %, Symptomatic degenerative disc disease 20 %–22 %, Pseudoarthrosis (failure of fusion) 14 %, Neuropathic pain 10 %, Recurrent disc herniation 7 %–12 %, Facet joint pain 3 %, Sacroiliac joint pain 2 % [2].

There are a lot of reports demonstrating mechanisms, clinical demonstration, treatment of patients with Failed Back surgery syndrome. In many cases the pain recurrence occurs after 3 or more months after surgery [10; 11; 12]. Radicular pain often is the result of nerve root inflammation with or without mechanical irritation. Inflammation within the epidural space and nerve roots, as can be provoked by a herniated disk, is a significant factor in causing radicular pain.

There is a lot of explanation of pain recurrence after spine surgery like a postoperative fibrosis or cyst reformation after surgery [1].

There is a theory of nerve root swelling which is the reason of pain [14]. Historical evidence of nerve root inflammation has been demonstrated during surgery in patients with radicular low back pain (LBP) from lumbar disk herniation. Animal research in dogs and rats also has revealed severe inflammation locally within the epidural space and nerve root after injection of autologous nuclear material into the epidural

space. A high level of phospholipase A2 (PLA2), an enzyme that helps to regulate the initial inflammatory cascade, has been demonstrated in herniated disk material from surgical samples in humans. Leukotriene B4, thromboxane B2, and inflammatory products also have been discovered within herniated human disks after surgery. The best cost effective way to treat this complication is steroid injection into the epidural space. An epidural steroid injection is performed to help reduce the inflammation and pain associated with nerve root compression. Nerve roots can be compressed by a herniated disc, spinal stenosis, and bone spurs. When the nerve is compressed it becomes inflamed. In summary, the evidence is good for radiculitis secondary to disc herniation with local anesthetics and steroids and fair with local anesthetic only; it is fair for radiculitis secondary to spinal stenosis with local anesthetic and steroids; and limited for axial pain and post surgery syndrome using local anesthetic with or without steroids [9].

Epidural injections are one of the most commonly performed interventions in the United States in managing chronic low back pain [3].

Epidural steroid injections are used with increasing frequency as a less invasive, potentially safer, and more cost-effective treatment than surgery. However, there is a lack of data to judge the effectiveness and safety of epidural steroid injections for spinal stenosis. Epidural injection of 1–3 ml. of 0.25–1 % lidocaine followed by 1.5–3 ml. of 40 mg/ml triamcinolone is performed. The choice of which steroid to use is at the discretion of the treating physician based on his or her usual clinical practice. Betamethasone (6–12 mg.), dexamethasone (8–10 mg.) or methylprednisolone (60–120 mg.) may also be used [4; 5; 6; 7; 8; 13].

So the aim of our work is to treat with the method of steroid injection to epidural space the patients who have recurrent pain in early (7–15 days) after spine surgery.

Methods

We have operated on 204 patients with lumbar disc herniation with endoscopic transforaminal approach. In all

cases the adequate herniation extraction and discectomy was performed. The endoscopic visualization with Rx-guiding of working cannula and forceps help to confirm the productivity of surgery.

The operations were performed under epidural anesthesia. During anesthesia solution of bupivacaine is used. The working time of that anesthetic is about 5–7 hours which let us estimate the results of surgery on the next day because no effect of anesthesia was at that time. The patients gave their remarks comparing the pain in leg in pre and postoperative period. The pain was estimated by VAS scale. The 82–85 % of patients had good results, they mentioned that they didn't have any pain and didn't need any drugs. The 28–30 % of those patients came back in the period of two weeks after operation for examination and told about the pain in leg which occurred after

the first week from surgery. The pain wasn't so strong as in the preoperative period. There are no disc prolapse recurrence on MRI examination performed in early postoperative period. So the results of MRI examination let us explain the pain of this patients as a result of nerve root swelling. For treatment we use nerve root blockades with steroid injections. The injections have been done by the method described by Juergen Kraemer in the handbook *Spinal Injection Techniques*. The injections were performed under C-arm control. The point of needle injection was middle line, the 2,0 ml. 1 % of lidocaine was used for soft tissue. The 16G spine needle was immersed from middle line under a little degree to the necessary disc space. The important point is the right way of spinal needle positioning. The control of procedure was done in anteroposterior and lateral RX view which is shown in the picture below (Pic. 1).



Pic. 1. The picture shows the RX-control in anteroposterior position spinal needle placement

During the needle placement patients can feel pain in leg which lets us be sure that the tip of needle is near the nerve root. After it 1,0 1 % solution of lidocaine and 120 mg. of methylprednisolone is injected. In most cases the pain decreases after 3–5 minutes. Patients leave the hospital after one hour.

Results

The nerve blockades were performed in 32 cases, 11 patients needed additional injections that were performed after a week. Following up patients during 8 weeks let us confirm

high effectiveness 85 % of this method for treatment patients with recurrent pain after spine surgery

Conclusion

In 30 % of patients after minimal invasive spine surgery recurrent pain is a result of nerve swelling. In this cases MRI must be performed to exclude the new disc prolapse. Selective nerve root blockades performed under RX control are effective and non invasive method for treatment of this patients.

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Hakobyan Arman Pargevi,
Central Clinical Military Hospital of RA,
PhD in medical science, Department of Neurosurgery
E-mail: neuroarman@yahoo.com
Abrahamyan Samvel Panduchti,
Central Clinical Military Hospital of RA,
Department of Anesthesiology

Peculiarities of anesthesiology of minimal invasive spine surgery

Abstract: the 204 percutant RX-controlled lumbar disc extractions have been done in our department. The transforaminal approach was performed, the disc herniation was extracted under endoscopic control. In all cases the epidural anesthesia was performed. We would like to introduce the peculiarities, complications of epidural anesthesia.

Keywords: epidural anesthesia, peculiarities, complications, endoscopic lumbar discectomy.

Introduction

The advantages of minimal invasive spine operations which are called other way key hole or endoscopic operations are less tissue trauma, and the endotracheal intubation is absent. This two factors let surgeon activate patients after 3–4 hours after surgery and minimize the duration of hospitalization up to one day. This kind of operations were performed under local anesthesia which is the most popular method for this type of surgery. For relaxation and comfort of the patient, sedation with intravenous Midazolam or Fentanyl was administered by the anesthetist. Some patients were uneasy about having the operation performed under local anesthesia and so the operation was done under general anesthesia [1].

The local anesthesia with intravenous sedation is not enough in some cases, as because of pain patients feel discomfort and their motions are difficult to control, but usage of local anesthesia helps to prevent nerve root injury. The general anesthesia is perfect for patient and surgeon too, but there is possibility of nerve root damaging because there is no possibility to have verbal contact with patient.

The epidural anesthesia with only sensor block is perfect for such operations because it lets patient be in comfortable position during surgery until surgical instruments touch the nerve root, in this cases patients feel pain and the surgeon stops the movies and checks the position of instrument. So epidural anesthesia and analgesia are used widely during surgical procedures and for pain control. This is generally regarded as safe and effective method of anesthesia [2]. There are different complications after epidural anesthesia. For example authors report four cases of neurological complication after epidural anesthesia. After summering the possible reasons authors did the following conclusion. The conclusions to be drawn from these experiences are as follows: [1] ischemic injuries to the spinal cord may occur in children during epidural anesthesia, but spontaneous infarction of the spinal cord also may occur in patients who experience hypotension absent epidural anesthesia; [2] collection of outcome data for a large number of children undergoing epidural anesthesia is necessary and desirable to define the magnitude of risk, thought at this time to be quite small; toward that end, the PRAN continues to accumulate data in North America and to enroll new participating sites,