

Initial Experience of Oxygen-Ozone Treatment for Disc Herniation in Bolivia

A Report of 120 Cases

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SUMMARY – We describe our initial experience using an oxygen-ozone mixture to treat herniated cervical and lumbar discs in Bolivia from August 2003 to June 2005. In all the 120 patients were treated. Despite the limited number of cases our experience provided statistically significant conclusions.

Introduction

The application of ozone (O_2-O_3) in the treatment of cervical and lumbar disc herniation is a widely used treatment in Europe. Our is the first experience of this therapy in Bolivia.

A herniated disc is accompanied by mechanical factors¹ and in the last years evidence of biochemical or immunological² alterations has also emerged.

Lumbar disc herniation is commonly responsible for low back pain and the condition for which spinal surgery is carried out most frequently³.

There is evidence that many patients with symptoms of nerve root compression from disc herniation will get better using conservative methods such as physiotherapy, and the herniation will eventually disappear in a few months. In addition, patients with known disc herniation live with their lesion in between pain attacks, even though the morphology of the disc lesion remains unchanged on CT and/or MRI controls.

For over fifty years neurosurgeons have been searching for a method which would allow shrinkage of herniated or protruded discs to solve the problem of pain. Although disc compression is corrected by surgery many patients continue to feel pain either attenuated or even exacerbated, irrespective of the structural changes of the disc herniation disclosed by CT and/or MRI scans after the operation⁴.

A number of non invasive percutaneous techniques have been conceived which aim to remove and/or cause shrinkage of the discal tissue. The common principle of these techniques is that of acting directly on the disc structure without access

to the spinal canal to eliminate the possibility of scar tissue forming in the epidural space, which would cause compression of the nervous tissue and adhere to the moving bones.

Much research has been done on the various aspects of disc pathology, and on the possible solution to the problem. Studies on pain originating from disc disease show that it may be a consequence of biochemical mechanisms of acid intoxication of the nerve. These may somehow be independent from the mechanical problem, but depend on an autoimmune reaction producing a chronic inflammatory response which engenders an acid environment, or a situation of ischemia⁵.

A mixture of O_2-O_3 has been used in medicine since 1985 to treat herniated disc. The effect ozone is thought to have in the herniated disc as such is based on the biochemical composition of the intervertebral disc mainly composed of proteoglycans and collagen⁶.

Hence the nucleus pulposus and the herniated disc are complex macromolecular structures containing water linked to various hydrophilic matrices. Because of its solubility and pressure, once injected into the disc, ozone dissolves in the intradiscal water and immediately decomposes generating a ROS cascade⁷.

Patients and Methods

Our study reports the first experience in Bolivia August 2003 and June 2005. We treated 120 patients by intradiscal injection of ozone in cervical herniated discs, and paravertebral injection in lumbar herniated discs.



Figure 1 Preparing the patient.

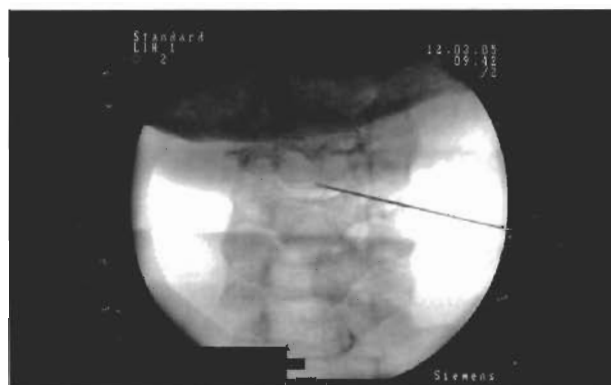


Figure 2 Anteroposterior fluoroscopic imaging to check correct placement of the needle in the disc.



Figure 3 Laterolateral fluoroscopic imaging to check correct placement of the needle in the disc.

All patients with diagnostically confirmed cervical and lumbar discs herniation, diagnostic verification by CT and/or MR scans exhibiting the disc herniation or protrusion with nerve root compression.

Steroidal drugs were not administered as the prospect of solving the problem without drugs or conventional surgical treatment was offered to the patients who accepted after detailed explanation.

We used the intradiscal approach for the cervical region and the classical technique of paravertebral percutaneous infiltration for lumbar disc herniation.

For the treatment of cervical herniated disc, the patient is positioned on the surgical bed face up with a cushion under the cervical region in a sterile surgical operating room.

After deep sedation by Propofol under C type arm X ray surveillance, the disc is punctured with a 22G 3 1/2 spinal needle. The tip of the needle has to reach the middle of the disc.

The entire procedure was done under continuous fluoroscopic control (figure 1).

Once in place the position was confirmed by lateral and anteroposterior imaging (figure 2-3) 7 to 10 ml of O₂-O₃ at 30-40 micrograms/ml was injected

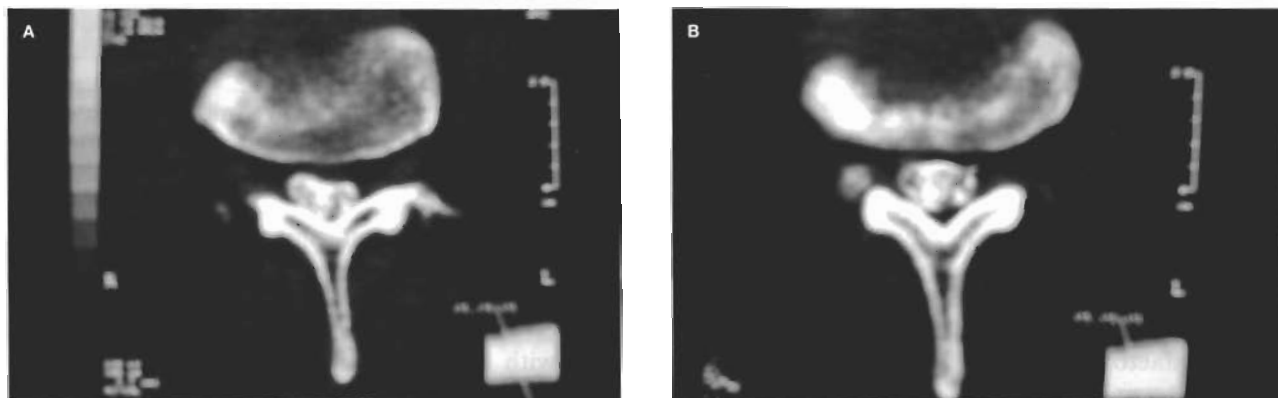


Figure 4 (A) Right herniated disc L3-L4. (B) The herniation has completely disappeared at CT follow up four months after oxygen-ozone treatment.

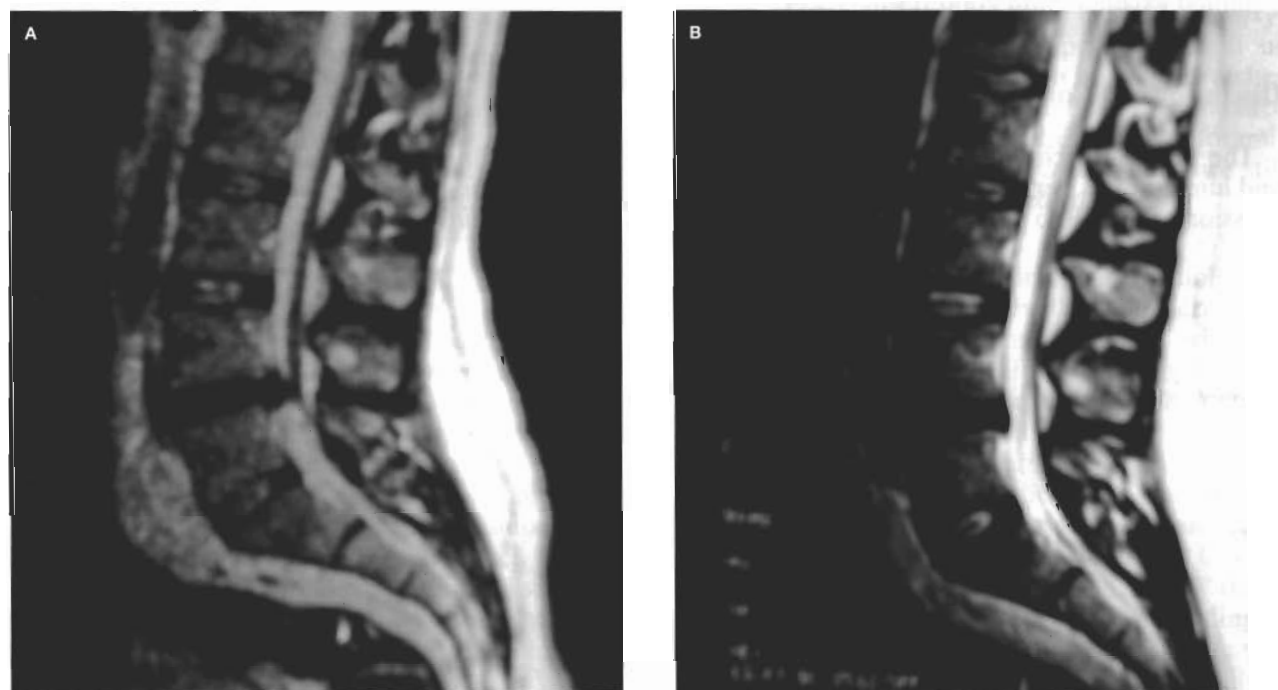


Figure 5 (A) Large herniated disc L4-L5. (B) Follow-up MRI four months after oxygen-ozone treatment showing complete disappearance of the disc herniation.

into the inside of the lesioned disc. The patient was discharged on the day after the procedure.

For lumbar herniated disc we used the classical technique of percutaneous infiltration that is possible only with CT and /or MR imaging and simple X ray investigation of the lumbosacral spine to ascertain and confirm the anatomic levels affected by disease and the reference points on the skin surface. After confirming the lesion levels the skin is marked and the treatment starts.

The lumbar reference points refer to the bisiliac line and the relative spinous process, moving about 3-3.5 cm.

From the apophysis the needle is inserted with precision.

The treatment is bilateral divided into four sites of injection of O_2-O_3 in the paravertebral area, two above and two below the metametric level of the pathology.

The concentration used is 30-40 micrograms/ml with the administration in each point of 20 ml of O_2-O_3 . A 20 ml syringe is used with a TSK STERIJECT or TERUMO 21 G \times 2". We performed 20 sessions twice a week. The results were evaluated four or five months after the treatment was completed (figures 4, 5).

Results

Among the 120 patients (68 males and 52 females), 17 were treated for cervical discs and 103 for lumbar discs. The clinical effectiveness was evaluated and patients were followed up from four to eight months. Among the "cervical group" pain symptomatology and sensory dysfunction was completely abolished in 16 cases (94%) and improved in one case (5.8%). In the "lumbar group" excellent results were obtained in 71 patients (68%) good and satisfactory results in 15 patients (15%) and the result was poor with the dysfunction remained unchanged in 17 patients (16.5%). Eight patients from the latter group underwent surgical treatment and nine refused surgery. As a whole 86 patients obtained excellent and good results (82.4%).

Discussion and Conclusion

The surgical techniques used to treat cervical and lumbar discs herniation by relieving root compression often fail to provide a definitive or lasting

cure even in selected patients. In our experience administering oxygen-ozone therapy we obtained excellent and good results in 82.4% of patients.

Ozone therapy for the treatment of the cervical and lumbar herniated discs is a wonderful new alternative to surgery.

Accurate patient selection for this therapeutic alternative is very important to obtain good results, to avoid complications and avoid a negative outcome.

The effectiveness in using ozone therapy shows that with this method we can obtain very good results with minimum trauma and no complication. In addition ozone therapy is a very cheap treatment especially for third world countries such as Bolivia.

Acknowledgement

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