



Article

## **CALCIFIC POST-EPIDURAL STEROID INFILTRATION EPIDURITIS, WHEN AND IF TO TREAT WITH OZONE THERAPY**

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### **ABSTRACT**

Epidural administration of steroids in the treatment of acute or chronic low back pain has been taking place for over 30 years. Despite this, it is still a very controversial topic. Meta-analysis studies document the effectiveness of steroid procedures, although very serious complications can occur. The authors report their experience in the treatment with oxygen-ozone in three cases of calcific epiduritis post epidural infiltrations perform as a second-line treatment due to the ineffectiveness of this steroid therapy.

**KEYWORDS:** *oxygen ozone, epidural steroid infiltration, side effects, steroid infiltration, ozone therapy*

### **INTRODUCTION**

Epidural steroid infiltrations are used in clinical practice in case of low back pain caused by sciatica (1-3). The main goal of the injection is to relieve pain. In fact, no action is taken on the main cause of the symptomatology which, in the majority of treated cases, consists of protrusions or herniated discs. Almost all doctors who use this practice agree that, while the effects of the injection are generally temporary, they can reduce symptoms for a period ranging from a week to a year. If the initial injection is effective for a patient, a maximum of three infiltrations per year can be delivered.

Although many studies document the short-term benefits of epidural steroid injections, the data on long-term efficacy are less convincing. Indeed, the results of lumbar epidural steroid injections continue to be a topic of debate.

The therapy, in most cases, is well tolerated by the patient, although minor, sometimes very serious complications are reported in the literature (4-26). Contraindications to carrying out this surgery are clotting disorders, pregnancy, local infections at the presumed entry site (osteomyelitis and spondylodiscitis), and overt allergy to local anesthetics and cortisone.

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The epidural infiltration procedure is performed under local anesthesia through a percutaneous approach, and a 20-25 G (gauge) spinal needle is inserted into the epidural space. After verifying the exact positioning of the needle, a mixture of anesthetic and cortisone is injected to obtain the therapeutic effect. In the thirty minutes following the procedure, the patient is kept lying down and under observation, then discharged in the absence of complications.

## MATERIALS AND METHODS

In the period October 2019 - January 2021, three female patients aged between 59 and 66 years with a neuroradiological picture of calcific epiduritis post epidural steroid infiltrations came to our observation. In two of these patients, antalgic treatment with oxygen-ozone therapy under Computer Tomography (C.T.) guidance was performed.

### *Infiltration Technique*

All treatments were done under C.T. guidance. After being informed about the procedure and possible complications, the patient signs the informed consent. Then, preliminary CT scans are performed with the patient prone to confirm the pathology and the level to be treated. At this point, the skin is disinfected using special preparations for general skin antisepsis (Citro jod 100 registration No. 1805 of the Italian Ministry of Health based on iodine polyvinylpyrrolidone).

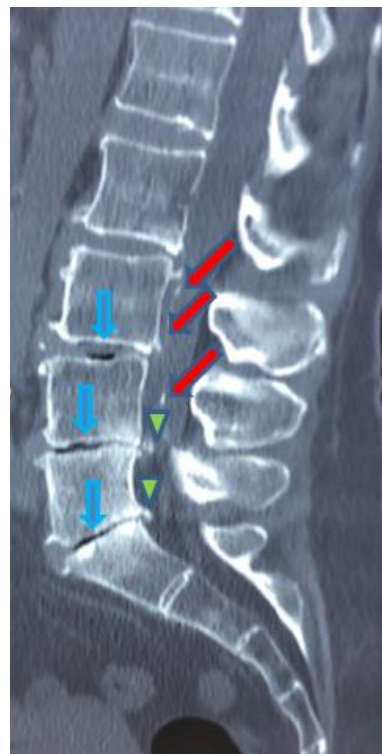
A preliminary C.T. scan is performed to identify the skin approach point. Next, local anesthesia is delivered with ethyl chloride spray, and then, again using the C.T. guide, a spinal needle is inserted normally using needles of varying caliber between 22 and 25 G. The perfect positioning of the needle is checked with a C.T. scan. A 10 ml syringe in polyethylene is then filled with the gaseous mixture at 25 µg / ml concentration.

The gaseous mixture is then injected. Generally injecting a variable volume from 3 cc to 5 cc of the O<sub>2</sub>-O<sub>3</sub> gaseous mixture. After the infiltration, other C.T. scans are performed to document the correct distribution of the gaseous mixture. All material used must be sterile and single use.

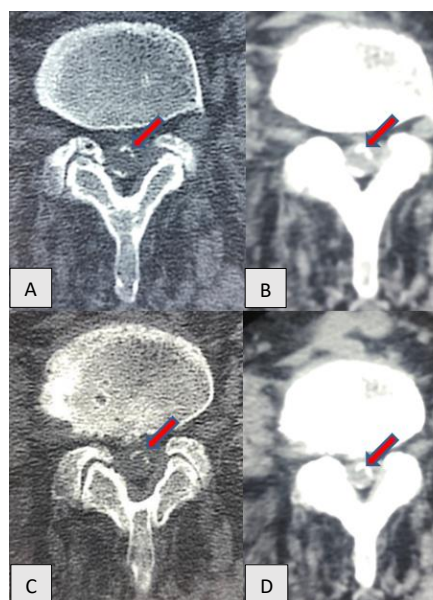
### *Case 1*

B.G., a 66-year-old female, came to our observation requesting possible treatment with oxygen-ozone for discopathies L4-L5 and L5-S1. The CT survey in October 2019, highlights the presence of degenerative discopathies in L4-L5 and L5-S1 with associated circumferential protrusions of the partially calcified interposed annulus (Fig. 1, 2A-D).

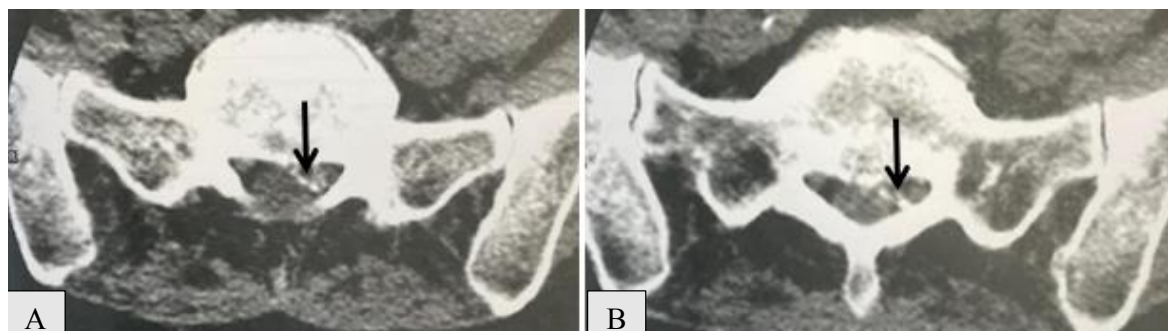
The C.T. survey also highlights the presence of widespread calcifications along the dura case extended from L2 to S1, the result of previous infiltrative treatment with steroid epidurals (Figs. 1 - 2A-D). In fact, in the ten months preceding our recruitment, the patient had undergone three epidural infiltrations of steroids. The first infiltration was carried out in December 2018, the second one month later in late January, and the third in late April.



**Fig. 1.** Lumbar CT sagittal reconstruction with bone algorithms: calcific epiduritis (red arrows), degenerative disc diseases L3-L4, L4-L5 and L5-S1 with vacuum disk (blue arrows) and partially L4-L5 and L5-S1 protrusions calcifications (arrowheads).



**Fig. 2.** (A-D) Lumbar CT: axial scans with algorithms for both bone and parenchyma: calcific epiduritis (arrows).



**Fig. 3.** (A-B) Lumbosacral CT after three epidural steroid infiltrations: calcific epiduritis (arrows).

The patient came to our attention in October 2019 due to the persistence of painful symptoms characterized by acute low back pain complicated by right sciatica in the distribution area of L5, despite previous steroid treatments.

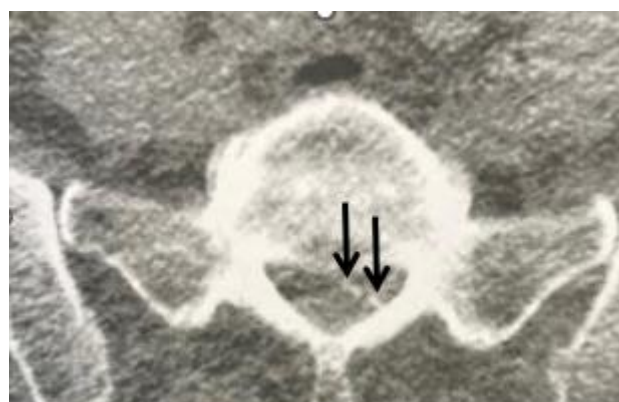
At the time of our clinical evaluation, we decided to perform a lumbosacral C.T. scan before any therapeutic decision. On October 17, 2019 the patient underwent the Computerized Tomography exam requested by us, which highlights a picture of calcified epiduritis after epidural steroid infiltrations and the presence of multiple partially calcified lumbar discopathies in particular at L4- L5 and L5-S1. With the evidence of the C.T. picture, we decided to send the patient to a physiatrist colleague for an evaluation, temporarily avoiding a therapeutic approach with oxygen-ozone therapy.

#### Case 2

F.S. 59-year-old female. Following left acute lumbosciatica in the distribution area of left S1, she undergoes three epidural steroid infiltrations in May 2020-January 2021. The patient reports that after each treatment, the sciatica symptomatology partially regresses for a short time, almost nothing after the first session and after the second and third infiltration. The well-being lasted twenty / thirty days, then returned to a similar entity to the pre-treatment period.

In September 2021, the patient came to our attention for a possible attempt to resolve sciatica symptoms with oxygen-ozone therapy under a C.T. scan. Having examined the lumbosacral C.T. scan carried out on September 115, 2021 (Fig 3A-B), which documents a calcific epiduritis L5-S1 on the left side. The patient was offered three infiltrative sessions under C.T. scan with oxygen-ozone, carried out with prior informed consent, fifteen days from each other, were proposed to the patient.

The patient reported significant clinical improvement from the first therapy session with the almost total disappearance of the sciatica symptoms and well-being that remains constant after the second and third infiltration. Therefore, in January 2022, we expected to perform a clinical check and a C.T. scan of the picture (Fig. 4). Clinically, the patient did not present any neurological deficit, and the sciatica symptoms appeared completely resolved, while the C.T. picture appeared unchanged compared to the previous investigation.



**Fig. 4.** Lumbosacral CT scan for post-zone therapy. The findings appear unchanged compared to the previous check, confirming the picture of calcific epiduritis (arrows)



**Fig. 5.** Lumbosacral CT: left paramedian disc herniation L5-S1 with situation of radicular disc conflict with the left S1 root (arrows)



### Case 3

A sixty-three-year-old female came to us following left lumbosciatalgia as from radicular disc conflict due to the presence of paramedian left L5-S1 subligamentous disc herniation, which determines an imprint on the emergence of the ipsilateral S1 root. It was initially managed everywhere with pharmacological therapy: ibuprofen CPR 600 mg plus thiocolchicoside cps 4 mg. for 7 days.

In the persistence of painful symptoms, there was congruence between the clinical and the neuroradiological picture. The C.T. survey documents, in fact, a left paramedian subligamentous disc herniation at L5-S1 with a compressive effect on the left S1 root (Fig. 5). The practitioner requests neurosurgical consultation. The neurosurgeon first recommended a microdiscectomy. The patient refused, asking if there were temporarily non-surgical alternatives to resolve the painful symptoms. In response to patient request, the neurosurgical colleague envisaged the idea of carrying out three infiltrations of steroid epidurals delayed over three months. After the first treatment, the patient reported little clinical benefit, so much so that she was advised to anticipate the second infiltration by about ten days. However, this session produced a clinical benefit lasting about 15 days with partial regression of sciatica symptoms. The third session was thus carried out as scheduled one month later, and, in this case, there was a clinical temporal improvement of short duration.

The patient, therefore, began a targeted physiotherapy program under the supervision of the neurosurgeon: Tecar therapy (10 therapeutic sessions) and a postural rehabilitation program. Unfortunately, the clinical benefits are minimal, and in the following six months, the patient undergoes another three epidural steroid infiltrations, thus making a total of six sessions. After two months with chronic symptoms, the patient undergoes a second C.T. scan (Fig. 6) which documents a picture of calcific epiduritis at L5-S1 prevalent on the left side. During this period, the patient came to our attention, and we proposed a treatment aimed at L5-S1 with oxygen-ozone. We carried out three sessions with the guided intraforaminal C.T. technique and obtained a notable reduction in lumbosciatica symptoms. Three months after the last treatment, we performed a control C.T. This confirmed the calcified images' persistence at the epidural level (Fig. 7).

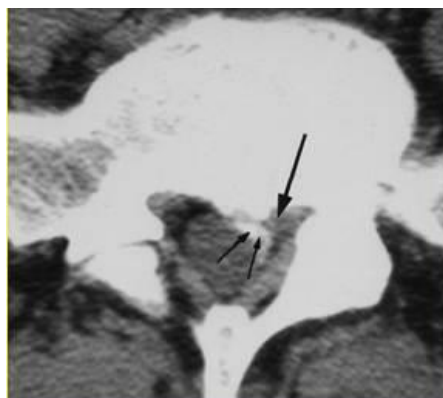
## DISCUSSION

The presence of soft tissue calcifications is a possible complication of the injection of corticosteroids. In literature, however, reports of this occurrence are rare; in particular, the evidence is reported above all in the treatment with steroids of the shoulder, elbow, and foot, while as regards epidural infiltrations, there are no reports in this regard (27-30).

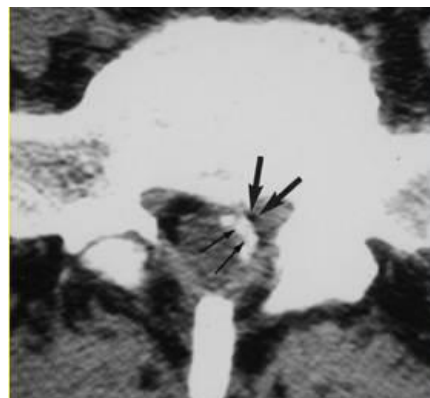
The fact of not finding articles that report the presence of calcifications after epidural steroid infiltrations, such as in our cases at the epidural level, we believe is mainly attributable to the fact that neuroradiological examinations are hardly carried out in the short and medium term to control patients treated with this technique.

In our opinion, certainly, steroid treatment leads to a clinical benefit in the short term, but this benefit is not long-lasting, so much so that many patients repeat these sessions. In our case series, a patient even went so far as to carry out six epidural steroid infiltrations, even if in a long over 1 year.

In our experience, post steroid infiltration calcific epiduritis is not an isolated case. This finding, although the number



**Fig. 6.** Lumbosacral CT after six epidural steroid infiltrations, appearance of calcific epiduritis (small arrows), and persistence of the left paramedian disc herniation (arrow)



**Fig. 7.** Lumbosacral CT after Treatment with oxygen ozone therapy: the picture of calphic epiduritis persists while a minimal volumetric reduction of the L5-S1 disc herniation seems to be appreciated (arrows)

of cases we report is only 3 who presented epidural calcifications to post epidural steroid infiltration, underlines the need of taking into account this possibility. Therefore, this data is very important for the subsequent therapeutic strategy.

In the face of a request for a second-line treatment with oxygen-ozone therapy, two of us decided to proceed according to this therapeutic indication, foreseeing a possible clinical benefit. In contrast, in one case, given the complexity of the symptoms, we considered this option a treatment with little chance of success, thus giving up oxygen-ozone treatment. Although there are no contraindications to oxygen-ozone treatment in such patients, it is never possible to guarantee patient results such as those obtained with oxygen-ozone therapy reported in the literature (31-35), equal to 75-80% therapeutic success in correctly recruited patients.

## CONCLUSIONS

In conclusion, we believe oxygen-ozone therapy should always be preferred as a first approach therapy for affected patients, if the steroid treatment has already been carried out and resulted in calcific epiduritis due to complications. As confirmed by numerous randomized and controlled studies, ozone therapy can give a lasting clinical result over time, without any side effect, such as calcific epiduritis, unlike steroid therapy.

### *Conflict of interest*

The authors declare that they have no conflict of interest.

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