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Case Report

LUMBAR SYNOVIAL CYST TREATED WITH OXYGEN-OZONE THERAPY: CASE REPORT

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ABSTRACT

The synovial cyst of the lumbar facet joints is commonly encountered in degenerative arthropathy. It can be symptomatic when its volume narrows the spinal canal or compresses a spinal nerve root. Many treatments have been proposed for treating symptomatic synovial cysts, from manual chiropractic therapy to systemic pharmacological therapy, from local infiltrations of corticosteroids to interventional radiology treatments with CT-guided needle fenestrations of the cyst to surgical removal. We report the results of an infiltration treatment of a cyst with the oxygen-ozone mixture in a 62-year-old patient suffering from left lumbosciatica resistant to pharmacological therapy for 4 months. Clinical and radiological findings showed a stenosis of the spinal canal caused by a synovial cyst in the left L4-L5. After the intracystic infiltrative treatment with an oxygen-ozone mixture, the patient had a reduction in radicular pain, which remained unchanged at the follow-up check-up**.**

KEYWORDS: *oxygen, ozone, therapy, synovial cyst, facet synovial cyst*

INTRODUCTION

The synovial cyst constitutes a common finding in the degenerative process of the spine, especially in the lumbar spine. It is typically associated with arthropathy of the facet joints, and it is most often constituted by a dilatation of the joint capsule of the lumbar vertebral joint, sometimes by a cystic dilatation of the yellow ligament, with gelatinous amber material inside. When projected into the vertebral canal, this dilatation causes a narrowing with consequent associated symptoms linked to the compression of the nervous structures in the vertebral canal.

From a histological point of view, fragments of *Ligamentum flavum*, synovial cells, myxoid mucinous material, fibrinoid, and calcium pyrophosphate deposits are present, with associated foreign body reaction giant cells surrounded by vascular, fibroblastic, and myofibroblastic proliferation (1-5).

The clinical presentation depends on the location, diameter, and relationships of the cyst with the nervous structures of the spinal canal. They are asymptomatic if they have a posterior, extracanal manifestation; however, when they develop inside the vertebral canal, they can cause lumbar pain, ipsilateral radicular irradiation, rarely a cauda syndrome, if they are associated with stenosis of the vertebral canal at the same level of development as the cyst.

On CT (Computerized Tomography), the internal density of the cyst can vary based on the composition of its contents: a simple fluid density is suggestive of a serous cyst, an increased density suggests hemorrhagic, hyperproteinic contents or with calcium deposits (6-7). Even on MRI, the appearance of the synovial cyst can vary based on its content: hyperintensity on T2 and hypo-isointensity on T1 suggest serious content. An increase in signal intensity in T1-weighted

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images highlights an increase in the protein or hemorrhagic content of the cyst. In contrast, a reduction in signal in all sequences reflects the presence of hemosiderin or calcifications.

The treatment of the synovial cyst can be conservative or surgical: among the former, we consider rest, physical therapy, acupuncture, the use of anti-inflammatories and painkillers, chirotherapy maneuvers, infiltration of the facet joints with steroids, aspiration of the cyst, CT-guided fenestration of the cyst wall (8-10). Surgical treatment via decompressive laminectomy followed by cautious dissection and removal of the lesion in its entirety is undoubtedly the most effective, with a lower risk of recurrence, even if it constitutes a more invasive approach, with the specific risk of increasing following the surgery, vertebral instability. For this reason, surgical treatment is limited to cases in which conservative treatments have not worked (11-14).

Among the most recently proposed conservative treatments is CT-guided intracystic infiltration of an oxygen-ozone mixture (15-23). The method adds the mechanical effect of fenestration/rupture of the cyst wall to the anti-inflammatory antioxidant effect of the oxygen-ozone mixture.

Case report

A 62-year-old woman with a silent remote pathological history who complained of left lumbosciatica pain resistant to pharmacological therapy with oral anti-inflammatories and corticosteroids, to infiltration with transforaminal and epidural corticosteroids and unresponsive to osteopathic and physiotherapeutic treatments (Tecar and Laser therapy).

The clinical evaluation, in addition to the neurological objective examination, used the Oswestry Disability Index (ODI) of the Visual Analogic Scale for the leg (VAS leg) and for the back (VAS LBP), were performed before treatment and in the follow-up after one and three months. The radiological investigations were based on magnetic resonance imaging without contrast medium in T1 and T2 sequences on the axial plane, T2 on the axial coronal and sagittal planes, and T2-STIR on the sagittal plane.

Technique

The patient was placed in a prone position, with support under the belly, to avoid excess lordosis. After careful skin disinfection and sterile field preparation, a CT scan of the lumbar region was performed. The synovial cyst was approached via an ipsilateral translaminar approach with a 22G Chiba needle. The needle was guided into position by performing further CT scans until it entered the cyst. After aspirating the cyst, approximately 5 cc of an oxygen-ozone mixture at a concentration of 27 mcg/ml was injected into the cyst. Finally, a final CT scan was performed to evaluate the rupture of the cyst and the leakage of gas into the epidural space and the facet joints (Fig. 1).

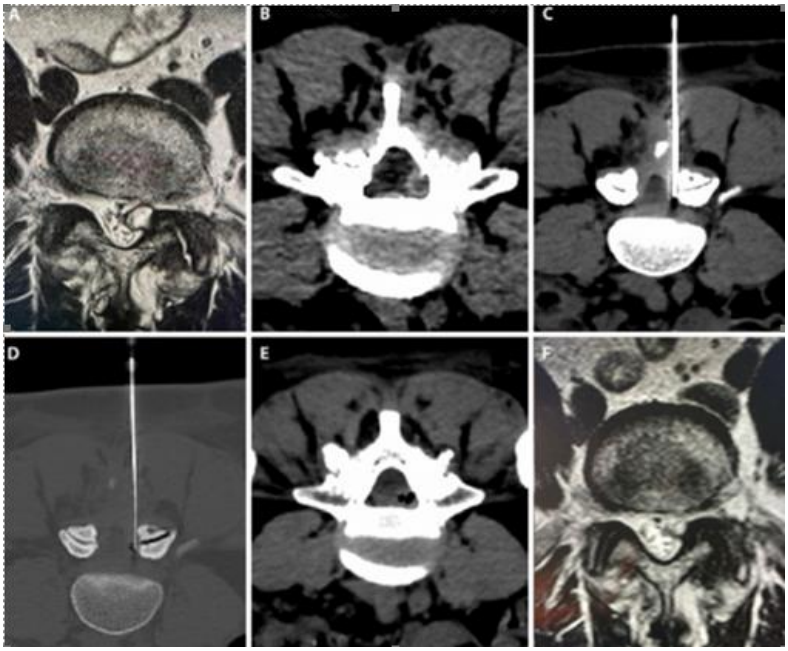

Fig. 1. ***A****): An axial T2W scan highlights a large synovial cyst of the left L4-L5 zygapophyseal joint;* ***B****): CT axial view of the same cyst with thickening of its walls;* ***C-D****): intraprocedural CT scan showing the correct positioning of a 22G Chiba needle inside the cyst;* ***E****): TC control after injection of the oxygen-ozone mixture; the presence of gas outside the cyst is evident.* ***F****): MRI scan highlights coarctation with a reduction in cyst volume.*

The patient was then discharged after two hours of observation with instructions for follow-up. The intracystic oxygen-ozone mixture injection procedure proceeded smoothly without adverse effects, and the patient was discharged two hours after the procedure. After the treatment, there was an immediate reduction in the painful sciatica symptoms with a reduction in the VAS, which remained reduced in the one and three-month checks (VAS Leg), without substantial changes in chronic lumbar pain between the pre-operative evaluation and the follow-up checks (VES LBP). In the follow-up checks one and three months later, the patient reported that she had maintained the improvement in painful symptoms perceived immediately after the procedure, and the ODI went from 74 before the treatment to 35 at the one-month check-up and to 37 that of three months (Fig. 2).

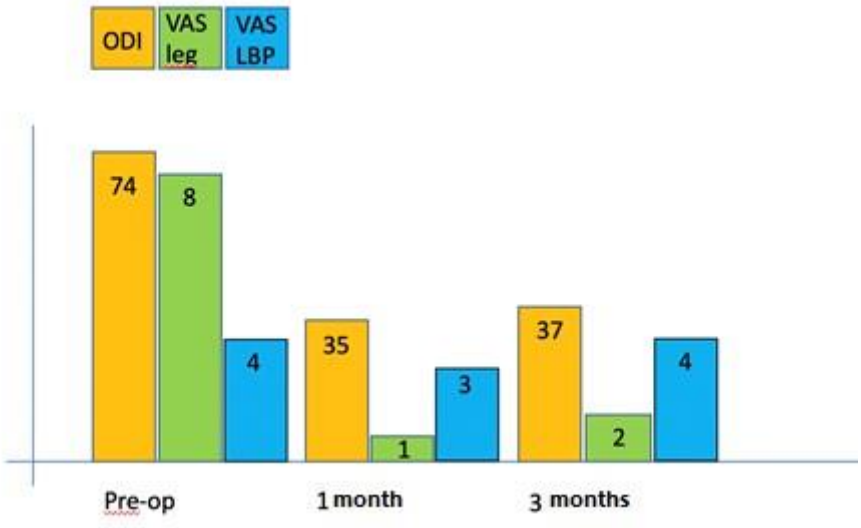

Fig. 2. ***ODI*** *went from 74 before the treatment to 35 at the one-month check-up and to 37 at three months; reduction in the* ***VAS****, which remained reduced in the one and three-month checks (****VAS Leg****); no substantial changes in chronic lumbar pain between the pre-operative evaluation and the follow-up checks (****VES LBP****).*

DISCUSSION

Treatment with the injection of an oxygen-ozone mixture is among the conservative methods commonly used in degenerative disc pathology to treat chronic lumbar pain and radicular pain through intradiscal nucleolysis, with transforaminal periradicular infiltration or within the paravertebral muscles (15-23).

Among the conservative treatments first proposed in the case of a symptomatic synovial cyst, there is the injection, under fluoroscopy guidance, of 1-3 cc of anesthetic, steroids, and contrast medium into the facet joints to try to obtain distension until rupture of the cyst wall (6-10). A good initial clinical response is followed by high relapse rates in the medium to long term.

A technique of direct puncture of the cyst, guided by CT scan, and infiltration of anesthetic and corticosteroids has also been described, with an increase in success in the immediate post-operative period, but also in this case followed by a high possibility of recurrence (10).

Shah et al. (12) describe the “fenestration technique,” which consists of repetitive movements of the needle back and forth within the cyst, followed by aspiration of the cyst, to create multiple holes in the wall of the lesion. Satisfactory long-term results have been reported (12, 13).

In the reported case, the infiltration of an oxygen-ozone mixture into the cyst immediately reduced the intensity of radicular pain, which was maintained in the follow-up checks one and three months later. This result is linked to the mechanical rupture of the cyst wall and the anti-inflammatory effects of ozone.

CONCLUSIONS

CT-guided infiltration of an oxygen-ozone mixture into the synovial cyst is a safe procedure with immediate effects because of the rupture of the cyst wall and the anti-inflammatory effects of ozone. Unlike surgical removal, it does

not pose the risk of causing future iatrogenic instabilities, although it should not be forgotten that these can still occur. The synovial cyst is an epiphenomenon of an initial segmental instability. However, to our knowledge, it would be important to increase the number of cases of this treatment modality and evaluate individual cases with adequately long follow-up exams to confirm the validity of a conservative treatment.

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