



Evaluation Study

TREATMENT OF RHIZARTRHOSIS WITH OXYGEN-OZONE THERAPY: OUR EXPERIENCE

M. Bonetti¹, G. Bragaglio², G. Guarino², I. Marchina², G.M. Ottaviani³, M. Moretti² and G. Tabaracci⁴

¹ Department of Neuroradiology, Istituto Clinico Città di Brescia, Brescia, Italy;

² Oberdan Specialistic Clinic, Brescia, Italy;

³ Emergency and Urgency Department, Spedali Civili di Brescia, Brescia, Italy;

⁴ San Rocco Specialistic Clinic, Montichiari, Brescia, Italy

**Correspondence to:*

Matteo Bonetti, MD

Department of Neuroradiology,

Istituto Clinico Città di Brescia,

Via Gualla, 15,

25128 Brescia, Italy

e-mail: dottorbonetti@gmail.com

ABSTRACT

In recent years, the number of reports on the use of oxygen-ozone therapy for treating acute and chronic inflammatory joint disease has been constantly increasing. In this study, we report our experience in the treatment of rhizarthrosis. From March 2018 to February 2019, 27 patients (21 females and 6 males aged 58 to 79 years, mean age 67.8 years) were enrolled. They were affected by rhizarthrosis. The diagnosis was confirmed by clinical examination and radiographic findings from standard metacarpal trapezium joint radiograms. Of the 27 treated patients, the clinical result was excellent in 16 (59%), in 5 it was satisfactory (19%), while in the remaining 6 no clinical benefit was obtained (22%). Although our series is currently limited to only 27 patients, we believe oxygen-ozone therapy in the treatment of metacarpal trapezium rhizarthrosis represents a valid therapeutic option instead of the use of drugs such as NSAIDs and/or steroids, especially in the first phase of the disease.

KEYWORDS: *rhizarthrosis, thumb, osteoarthritis, trapeziometacarpal, joint*

INTRODUCTION

Rhizarthrosis is a degenerative-arthritis process that affects the joint of the base of the thumb (1, 2). The endurance of pain and the significant deficit of strength between thumb and forefinger can interfere with daily tasks such as – for example – turning a key, opening a car door, picking up a book, threading a thread through the loop of a needle; objects

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may fall from the grip of hands and night resting may be prevented. All these factors can cause a lack of autonomy, decreasing the overall quality of life (3, 4). Rhizarthrosis most frequently affects one side, and women over 40 are more likely to be affected by this pathology (1-4).

Conservative treatment involves administering anti-inflammatory drugs and braces that temporarily immobilize the joint or intra-articular infiltrations with cortisone. From a therapeutic point of view, using a specific handheld device may be useful to keep the joint locked, at least during the night. Simple analgesics such as paracetamol and, in the most painful phases, non-steroidal anti-inflammatory drugs can also be useful (5-17).

There are also some reports on the effectiveness of local infiltrative therapy with hyaluronic acid (18-20). In case of failure, surgery is performed. The surgery that currently provides the most significant therapeutic success is the so-called biological arthroplasty (21, 22).

In light of the recent results reported in the literature on the use of oxygen-ozone therapy to treat acute and chronic inflammatory pathology of small and large joints (23-32), we treated 27 patients suffering from arthrosis (Fig. 1).

MATERIALS AND METHODS

From March 2018 to February 2019, 27 patients with a diagnosis of rhizarthrosis confirmed both by clinical examination and by radiographic findings with standard radiograms of the hand (Fig. 1) were enrolled. Specifically, 21 females and 6 males aged between 58 and 79 (mean age 67.8 years). All treatments were carried out using needles 25 G 5/8 Terumo orange colour code (Fig. 2).

After signing an informed consent, all patients underwent a local infiltration with oxygen-ozone at a concentration of 20 micrograms/ml. The first treatment was delivered using the CT guide to allow perfect access to the joint. Local anaesthesia was performed with ethyl chloride spray, and then, again using the CT guide, the needle of 25 G was inserted in the joint (Fig. 3).

Once the entry point had been correctly identified, it was marked with a demographic pencil and kept constant for subsequent treatments. A 5 ml syringe in poly-ethylene was then filled with the gaseous mixture at a 20 µg/ml concentration. The gaseous mixture was then injected, generally using a variable volume from 3 cc to 5 cc of the O₂-O₃ gaseous mixture. All materials used must be sterile and single-use. After the infiltration, other CT scans were performed to document the correct distribution of the gaseous mixture (Fig. 4).

An average of 6 to 10 infiltrations of the metacarpal trapezium joint every two weeks were performed depending on the severity of the case treated. In particular, in six patients, we performed six injections, in 12 eight infiltrations and the remaining 9 ten



Fig. 1. (A-B): radiographic diagnosis of rhizarthrosis (arrows). A): oblique projection and B): Kapandji projection for the evaluation of the joints of base of the thumb.

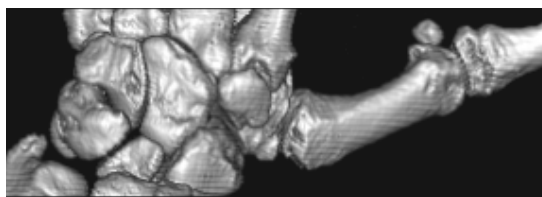


Fig. 2. 3D CT reconstruction of the metacarpal trapezium joint: rhizarthrosis.

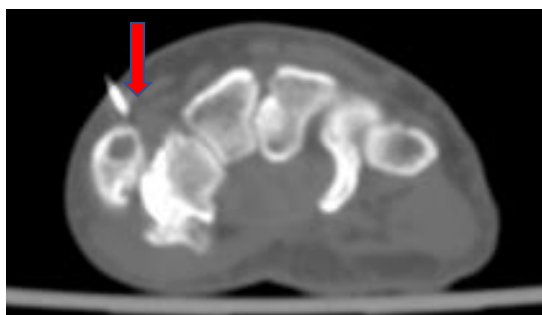


Fig. 3. Preliminary CT scan: checking the positioning of the 25G needle (arrow).

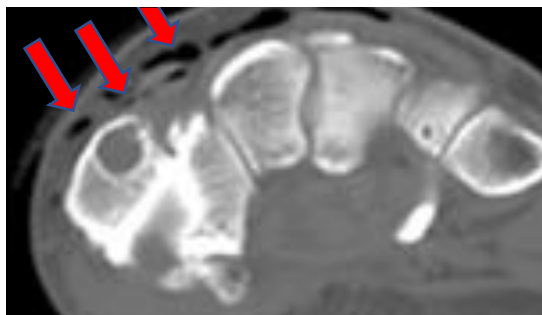


Fig. 4. TC control of the distribution of the gaseous mixture (arrows).

applications. Having to treat an extremely sensitive region, local anaesthesia with ethyl chloride spray was always performed. Infiltration was always well tolerated by patients.

RESULTS

All patients included in the study were clinically evaluated one month after the end of the therapy. During the treatment period, any anti-inflammatory therapy was stopped. Instead, patients continued to use the brace. Therefore, only 8 out of 27 patients continued to take advantage of the brace.

Among 27 treated patients, there were excellent, satisfactory and poor results in 16 (59%), 5 (19%) and 6 (22%) subjects, respectively. Clinical results were evaluated one month after the end of treatment. Excellent results were those with almost complete disappearance of painful symptoms; satisfactory results were those where patients reported only a partial remission of painful symptoms; poor results were those with no clinical benefit. These last were referred to orthopaedics for a further therapeutic decision.

DISCUSSION

In rhizarthrosis, the arthrosis process causes the cartilage that lines the two bones in contact (trapezius and first metacarpal bone) to become thinner; this process causes further friction, wear and pain. It is challenging to translate the intensity of pain reported by the patient in an objective evaluation of the joint condition. In fact, significantly compromised clinical pictures at radiographic control are often associated with a very low impact on the patient's activity, while, in other cases, early stages can be extremely troublesome and cause severe functional deficits. The main symptom is pain, which appears when the patient performs simple gripping and gripping movements with the thumb (1-4).

Pain can also appear spontaneously with the change of weather, especially in the presence of humidity. Pain is also awakened by direct pressure on the joint at the base of the thumb or by grabbing the thumb and pushing it towards the wrist. Over time, the reduction of the force expressed during gripping becomes more and more marked, and pain appears while carrying out light manual activities more and more.

The characteristic of rhizarthrosis is also the appearance in the initial stages of swelling at the base of the thumb, followed by progressive displacement of the base outwards. In the first phase of the disease, no consensus has emerged in the literature regarding a single effective protocol for conservative treatment, and in the literature, there are few works compared to what is proposed for the surgical techniques (1-23).

The therapy involves keeping the joint at rest through braces and treatment with non-steroidal anti-inflammatory drugs (NSAIDs), generally at full dosage for an adequate period. Intra-articular infiltrative therapy with corticosteroids is also possible. Sometimes, physical therapy is associated (ultrasound, iontophoresis, etc.). Rarely is there an indication of surgical treatment utilizing arthroplasty (4-23).

In light of our experience in oxygen-ozone therapy treatments in various musculoskeletal districts, we used this type of treatment for analgesic purposes also in rhizarthrosis. The mechanisms of action of the oxygen-ozone gas mixture are well-known and widely documented in the literature (23-32). The rationale for intra-articular oxygen-ozone infiltration is based on relieving inflammation with subsequent analgesic action. The oxygen-ozone gas mixture injected normalizes the level of cytokines and prostaglandins, increases superoxide dismutase, minimizes reactive oxidant species and improves local circulation with a eutrophic effect.

CONCLUSIONS

Although the reported case series is based on evaluating only 27 patients, we believe oxygen-ozone therapy in treating metacarpal trapezius rizarthrosis is a valid therapeutic option, especially in the first phase of the disease. It can be used instead of other drugs, such as NSAIDs and/or steroids. The good results obtained in our series are related to some of the main activities of oxygen-ozone therapy: the intra and trans-tissue oxygenation with consequent improvement of both hypoxia and ozone's anti-inflammatory, analgesic and eutrophicating activities.

In conclusion, oxygen-ozone therapy can be considered an excellent therapeutic approach for patients afflicted with rizarthrosis.

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