OZONE THERAPY AFTER SURGERY DENTAL IMPLANT

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After the surgery implantation can rise up complications that involve various clinical aspects, for short or for long time.
Short time accident:

- infection of the implant site

- dehiscence of the surgical wounds

- loss of the implant.
Short time accident:

overheating of the implant site

peri-implantite
Long time accident:

over infection of the implant site

\[ \downarrow \]

peri-implantite

\[ \downarrow \]

bony reabsorptions

\[ \downarrow \]

micro-movements

\[ \downarrow \]

hazard of implant failure.
Long time accident:

important bony reabsorption peri-implantare
The infection can be caused by different factors:

- scarce oral hygiene
- habit to the smoke or to the alcohol
- states of local or systemic immunodeficiency

In case of appearance of bony injuries it needs to put all the possible countermeasures into effect. Among these methodic ones we enumerate the treatment with diodes laser, the surgical toilet, joined to regenerative procedures, both to be supported through the antibiotic therapy, the ossigenoterapia iperbarica or the ozone therapy.
MICROORGANISMS

The microorganisms of the oral flora are manifold, variable with the age. They are often the same saprophytes to produce infections.

The Streptococcus are the most manifold of the oral cable, they constitute halves the microorganisms of the saliva and the back of the language, a quarter of those of the plaque and the gingival furrow. You/they are classified in alpha, beta and range-emolitici. They are the most virulent. The more communes are: S. viridans, mitis, oralis, sanguis, gordonii, anginosus, constellatus, intermedius.
Others gram-positive are:

- **Enterococchis** are the more frequently found although constitutes a small percentage of the oral microbial flora; when you introduce in the infections they are difficult to be eliminated.

- **Peptostreptococchis** represent a **meaning quantity** in the sub-gingival flora, in the illnesses of the parodonto, in the abscesses odontogeni and of the soft tissues.

- **Stafilococcus** aureus is present in the oral cable of halves the population, especially in the nose and in the throat; it is often found in the **mixed infections of the gold-facial region**.
Gram-positive bacilluses and filamentous bacteria are present in the oral cavity and you/they can cause different pictures of infections:

- Actinomiceti:
- Rothia dentocariosa
- Eubacterium saburreum, E. lentum, E. timidum
- Difteroidi
- Lactobacillus

Among the **gram-adverse coaches**:
Veillonella: (V. parvula, V. atypical, V. dispar)
Neisseria: (N. sicca, N. subflava)
OTI vs OZONE THERAPY

The **OTI** is based on the principle of solubilizzare a volume (from around 0.3 to 5-6 mls) of oxygen in the blood when the patient, closed tightly in the room iperbarica in air to 2,6 atmospheres, pure oxygen breathes.

**L'Ozone therapy** not only promotes a more lasting oxygenation, but it enables a number of more effective biological mechanisms of the simple and transient (two hours) iperossigenazione to resolve nonelementary pathologies.
Contrarily of the oxygen that, after a least solubilizzazione in the plasmatic water, saturated only the hemoglobin partly oxygenated, the ozone, solubilizzato in the plasma, instantly reacts with various reducing biomolecole, that is donors of electrons (unsaturated fat acids, antioxidants what sour urico and ascorbic, tioli containing GROUP sulfidrilici.) producing an atom of oxygen radicalico and very reactive: $\text{O}_3 + \text{Biomolecole} \rightarrow \text{O}_2 + \text{O}'$ with training of peroxide of hydrogen $\text{H}_2\text{O}_2$
Activity immunomodulante of the ozone

In the **leukocytes** it stimulates the activity fagocitaria of the neutrofilis

In the **linfocitis** it baits some trials that go to regulate the expression of many geniuses.

Its claim results strengthened by the repetition of the treatments because the enabled linfocitis begin to release in alive the citochines, which enable other linfociti (effect priming) with the result of a progressive **immunitary amplification**.
Activity immunomodulating of the ozone

activity linfocitaria after ozonizzazione
Activity of the ozone on the plaques

Release of ATP and factors of growth what PDGP, TGF-β, bFGF, HGF, EGF e VEGF, all very important ones and in degree to explain because the treatment parenterale and local with ozonoterapia of chronic ulcers it allows an improvement of the vascularization and the rapid cicatrization of the wounds.
The physiological presuppositions on which the availment of the ozone founds him are to correlate him therefore to the beneficent effect that manages on Hemorrheology:

- Improvement erythrocytary filtrablety
- Lowering hemal stringiness
- Improvement aggregation of blood plaque
- Improvement availment and release of O2 from the Hb
Effect anti-edemagen

Hyperoxia

- arterial vasoconstriction
- < bleeding
- venous vasoconstriction
- < compression on the lymphatic vessels

< EDEMA
Mechanisms of claim of the ozone

1. Claim **indirect bactericide** = increased outturn of Leukocytes and Macrophages → ENGLOBEMENT

2. Claim **BACTERICIDE direct virustatic** = Ozone → outturn of Radical free → threadbare membranes of cells and bacteria

3. Improvement **local perfusion** → carriage and release of mediums (also drugs)

4. Stimulation activity **osteoclastic/blastic** → Bony Remodelling
Materials and methods:

Male patient, 48 years, anamnesis and instrumental investigations adverse preoperatory.

Submitted to surgical operation of positioning of fittings endo-osseus to the maxillary superior.

rx pre-operation

rx immediately post operation
Materials and methods:

During the postoperative period submitted to standard therapy through:

- amoxicillina cp 1 gr, 1x3 for 6 days.
- accurate oral hygiene.
- withdrawal from the habit to the tabagism and the use of alcoholic drinks.
Materials and methods:

Clinical check after 18 months: here he highlights light bony reabsorption to level of the implantar collar
Materials and methods:

Clinical Check after 24 months when he highlights bony reabsorption to level of the implantar collar and initial appearance of injury radiotransparent to level of the mesial implantar body.
Materials and methods:

To a follow-up to 36 months through rx intraoral comparison of upsurge of the Area of bony rarefy perish-implantar; clinically going by ample area of palatal bony deficit.
Materials and methods:

We proceed to surgical exploration that reveals injury perish-implantar
Materials and methods:

We highlight ample bony loss on the palatal slope
Materials and methods:

We proceed to sterilization of the implantars surfaces and bony through diodes laser (power 3.5 Watts for 20 sec). Inspection of the site implantar more Hydroxide graft than in partnership calcium to rifampicina
Materials and methods:

Sutures in Goretex 5.0 after the inspection.
Materials and methods:

New cycle of antibiotic (Ciproxin cp 500 mgs, 1x2 for 6 days) therapy is submitted to without result. To distance of 6 days overall dehiscence with necrosis of the mucous edge and exposure of the implant with mucous breach of 2.5 cms.

The patient reports subsequently only to have a diabetes uncompensated (260 mgs / dL) and to have played "you rinse" through liquors.
**Materials and methods:**

We decide to submit the patient to ozone therapy through:

**blood doping:**
250 ccs blood autologous ozonized with 200 ccs O2O3 to 40.
1 blood doping every 5 days for 2 times.

**local injections**
a gaseous mixture O2O3 intramucosal 3 ccs to 3 y every 4 days for 3 times.

**rinse daily** with ozonized water.
Results:

After 10 days at the end of the cycle of ozone therapy, the patient introduced an advanced state of recovery of the soft tissues perish-implantars, with closing of the palatal mucous breach and training of a satisfactory collar of mucous perish-implantars.
Results:

After 20 days at the end of the cycle of ozone therapy the patient introduced a complete recovery of the soft tissues perish-implantars, with closing consolidated of the palatal mucous breach.
Results:

With radiography to 6 months of distance an important bony regeneration is noticed with the complete reconstitution of the interface bone-implant in the center of the injury.
Results:

To distance of 6 months further complications are not developed, the integrity of the soft tissues is maintained; the implant has remained in center and has normally been prosthesisized.
Conclusions

L' ozone therapy, also within the oral surgery, an effective help reveals him in the obtainment of the recovery of the surgical wounds, with particular reference to the situations in which usual antibiotic therapy is not enough to reach the complete recovery.

Besides show to favor once in particularly effective way the bony regeneration that the infection is resolved