Patient's perception of the events during and after Osteogenic Alveolar Distraction

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ABSTRACT

Objective: The aim of the study was to evaluate the patient's perception of the events during and after an osteogenic alveolar distraction (OAD) procedure

Materials and Methods: A total of fifty-five (55) osteogenic alveolar distraction (OAD) procedures were performed in fifty (50) patients, who then were asked to answer ten (10) questions related to the treatment. Six (6) questions made reference to predefined values in a Visual Analogical Scale (VAS), three (3) questions could be answered by a predetermined answer, and only one (1) question had a free answer.

Results: In 76% of cases, the patient's description of the sensation felt during the surgery was good and bearable; 84% of the patients didn't feel pain after surgery. 4% of the patients felt pain during the activation period and 58% of the patients described the sensation during the activation period as pressure, felt most commonly, at the end of the period, and for about 20 minutes (66.6 %). In these cases the most frequently used analgesic was Paracetamol. Also, 46% expressed having had some difficulty to activate the device, with 10% of them in need of extra help. The presence of the activation rod caused discomfort in 52%. Finally, 78% of the patients treated with OAD would undergo this procedure again if it was necessary. A bone graft was performed in 27 out of the 50 treated patients, with 70% of them describing the bone graft surgery as more painful than the OAD.

Conclusion: The OAD technique had a high degree of acceptance among the treated patients, however, some details as the interference of the activation rod continue to disturb them. The acceptance of the OAD technique is much better when compared with bone graft surgery technique as a second treatment.

Key words: *Osteogenic distraction, alveolar process, perception.*

INTRODUCTION

Osteogenic Alveolar Distraction (OAD) is a technique based on the principles described by Ilizarov, (1,2) who has earned the credit for having defined and established the biological bases for the clinical use of osteogenic distraction in the management of different bone deformities. Block et al. (3,4) applied these principles experimentally and were the first to publish studies on the use of OAD in animals in 1996. The same year, Chin and Toth (5) reported the clinical use of OAD as a treatment in alveolar ridge deficiencies in the upper maxillary.

The OAD is a technique of gradual bone lengthening allowing the body's natural healing mechanisms to generate new bone to augment alveolar ridge height. (6,7). It has the ability to enhance osseous and soft tissue deficiencies simultaneously, offering a predictable result, with low morbidity and infection rates and a significantly shorter healing period to proceed with implant's rehabilitation (12 weeks) when compared with traditionally used methods (6,8,9).

Several studies have been published about the potential application and complications of a vertical distraction technique in patients treated with implants (7,9-13), with a few of them having described the patient's perception of the procedure (14-18). Nevertheless, no study has been published that shows the subjective patient's perception of the surgical procedure, during the surgery and in the immediate postoperative days.

The aim of the present prospective study was to evaluate the patient's perception of the events during and after alveolar reconstruction using the osteogenic alveolar distraction (OAD) technique.

MATERIALS AND METHODS

Fifty patients (33 women and 17 men; Age range: 19 to 66 years and a Mean age of 42 years ±13.49 SD) were submitted to an alveolar reconstruction procedure using the osteogenic alveolar distraction (ODA).

The patients underwent a total of 55 alveolar ridge distractions using an extraalveolar device Distractor® (Conexão, Implant System, São Paulo, Brazil).

In all patients were use the following preoperative protocol: 1 hour before the surgery Midazolam 15 mg, Dexamethasone 4 mg and Paracetamol 750 mg. After surgery, all the patients used diclofenac potassium 50 mg 8/8 hours for three days, paracetamol 750 mg 8/8 hours for three days and amoxicilin 500mg 8/8 hrs for seven days. None patients was alergic to the medications.

All patients enrolled in the study gave their informed consent for the procedure.

Osteogenic Alveolar Distraction Technique:

The patients were asked to rinse their mouth with 0.12% Clorhexidine Gluconate before the procedure. Local anesthesia was administered (Lidocaine 2% with epinefrine 1:100.000) in the area to be operated.

A horizontal incision was made in the vestibulum, after which a buccal mucoperiosteal flap elevation was performed to expose the lateral cortex, without elevation of the crestal mucosa. Prebending and adaptation of the distractor device were initially performed before the osteotomies. The transport segment was cut into an inverted trapezoidal shape with diamond discs, sagittal saws and chisels.

The transport segment was totally mobilized, although it remained attached to the lingual mucoperiosteum. After this, the distractor was positioned and fixed in place with 1.5 mm monocortical screws.

Variations in size of the transport disk and distractor device occurred according with each case. The device was activated to test for transported bone without interferences. The system was returned to its initial position and the flap was closed with 4.0 Vycril suture (Johnson & Johnson, Ethicon, Brazil).

A waiting period of 7 days was allowed with a rate of 0.33 mm every 8 hours (1 mm per day) for 6 to 12 days, according to the plan for each particular case. After 90 days, the distractor was removed and the implants were placed during the same surgery. If additional bone grafting was need to gain bone width, the procedure was made at that time and the implant placement was performed 5 months later. After 6 months of the implants' placement, the prosthetic restoration was performed.

Clinical follow-up examinations were performed at 7,10, 15, 20, 30, 60 and 90 days. The follow–up examination included a search for complications such as infection, tipping of the transport disk, paresthesias, epithelium invagination and/or fracture of transport disk or the transport plate. After 90 days, the device was removed and implants were placed. If additional width was required, bone grafting was performed at the tiem of device removal and implants were placement 5 months later. In all implant cases 6 months after implant placement, the prosthetic restoration was delivered.

EVALUATION CRITERIA

The patient's perception of the events during and after the osteogenic alveolar distraction (OAD) was evaluated.

Ten (10) questions about the treatment were made, five (5) of them making reference to predefined values in a Visual Analogic Scale (VAS). The scale was 10 cm long, one end corresponding to no pain or disconfort, the other to extreme pain or discomfort, and it was divided in 10 equal parts. Four (4) questions could be answered by predetermined answers with only one (1) question having a free answer.

The questionnaire made to the patiens was:

1: How do you describe the sensation feeling during the surgery to put the device?

2: How do you describe the pain or disconfort feeling after the surgery, before the activation period?

3: Did you feel pain when the device was activated?

4: If you feel pain, what medication did you take? (free answer)

5: How much time approximately in minutes have pain?

( ) 10 min ( ) 20 min ( ) 30 min

6: Whats the better word to describe the feeling felt after each activation?

( )Pain ( )Discomfort ( )Pressure ( )None

7: Did you feel any difficulty to activate the device three times daily?
8: How uncomfortable it was the presence of the activation rod in the mouth
during this period?
9: In case of being necessary it would make the surgery again?
( ) Yes ( ) No
In those cases were necessary a bone graft procedure, was made the next question:
10: If you make another surgical procedure like bone graft, how it would
compare it to alveolar distraction osteogenesis?
( ) Worst ( ) Worse ( ) Same ( ) Better ( ) Much better

RESULTS

There were made 50 questionaries. In 76% of cases, the patient's description of the sensation felt during the surgery was good and bearable (Fig. 1); 84% of the patients didn't feel pain after surgery. 4% of the patients felt pain during the activation period and 58% of the patients described the sensation during the activation period as pressure (Fig.2), felt most commonly, at the end of the period, and for about 20 minutes (66.6 %). In these cases the most frequently used analgesic was Paracetamol (84.5%).
Also, 46% expressed having had some difficulty to activate the device, with 10% of them in need of extra help (Fig.3). The presence of the activation rod caused discomfort in 52% . Finally, 78% of the patients treated with OAD would undergo this procedure again if it was necessary.
A bone graft was performed in 27 out of the 50 treated patients, with 70% of them describing the bone graft surgery as more painful than the OAD.

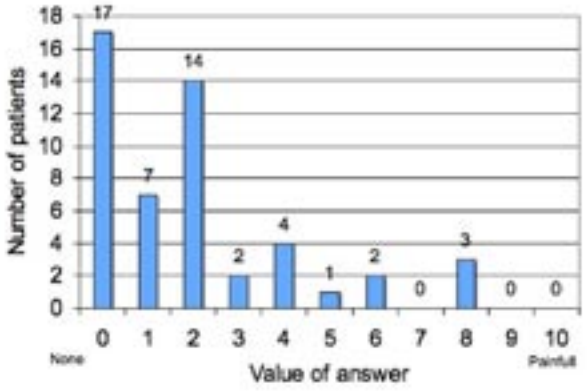

Fig. 1. How would you describe the sensation felt during the surgery to place the device?.

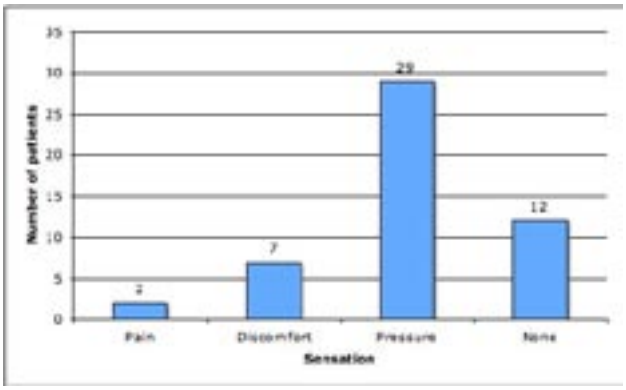

Fig. 2. What would be the better word to describe the sensation felt after each activation?.

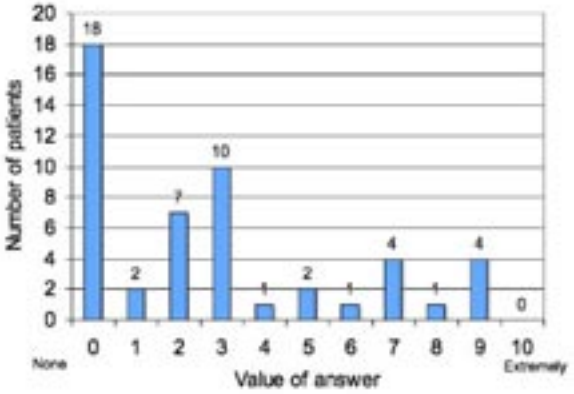

Fig. 3. Did you have any difficulty to activate the device three times daily? .

DISCUSSION

Osteogenic distraction (OD) is a technique of gradual bone lengthening that allows the body's natural mechanisms to create new bone (20). The OAD is a relative new method that, compared with onlay grafts or guided bone regeneration, has showed a lower morbility rate, better previsibility, less bone resorption and it also enable the lengthening of the soft tissues and vessels by histogenesis (9,10). Compared with other regeneration techniques, the OAD a shorter treatment time because the distracted segments are well formed in just 12 weeks (9).
The severity of the pain is one of the chief indicators of the patient's comfort during the postoperative period after the OD. In this study we evaluated the degree of pain and discomfort felt during the operative and postoperative period using the VAS scale, wich is considerated to be an efficient tool to evaluate clinical parameters that influence the subjetive experience of an individual, such as pain.
The use of VAS was proposed by Henrikson et al. (21) to measure swelling, and compared the effects of two drugs on the postoperative period following a third molar extraction surgery.

Berge (22), compared VAS' scale valves to three-dimensional mechanical measumerents of swelling using an extra-oral cephalostat, and concluded that the VAS scale is a reliable and respectable method.

The ability of the surgeon might influence the outcome of the surgery; based in this fact, only one surgeon was involved in this study. The obtained results indicate that the majority of the patients tolerated well the surgery to place the distractor and the next seven postoperative days. Conscious sedation with Midazolam 15 mg 1 hour before the surgery and specific drugs to control postoperative pain and swelling were used.

During the distraction period, 38 patients described an uncomfortable feeling of pressure, similar to that experienced during orthodontic movements, and 9 patients felt pain that was controlled with an analgesic drug. In those cases the pain and tension don't persist more than 20 minutes, as described by Gaggl et al. (13,14) and Urbani et al. (16,17). In the rest of the cases, the patients didn't describe any kind of sensation during the distraction period.

We agree that the presence of the device in the area for a long time including a healing, distraction and consolidation period can cause discomfort to the patients during function, as described by Oda et al. (23) and Papageorge (19). In our study, 17 patients referred discomfort caused by the presence of the device, especially in the anterior maxillary region. In the present study only in one case it was necessary to remove the device after 4 weeks because of the strong discomfort felt by the patient (15).

Ten patients related having had problems with the activation of the device, three of them in need of extra help to activate it. In just one case the patient did not comply with the instructions to activate the device, performing the device activation in counterclockwise sense, compromising the result of the treatment. This situation can be compared with the study made by Van Strijen (18), where the possible complications during the osteogenic distraction of the mandible were evaluated, concluding that the patient's compliance during the entire treatment period is essential, and thus careful patient selection is of outmost importance. Extensive pretreatment information should be provided to prevent unpleasant and disappointing results for patients and surgeon.

CONCLUSION

The technique of OAD had a high degree acceptance among the treated patients included in this study. However, some minor problems, as the interference of the activation rod, continue to disturb the patient. The acceptance of the OAD technique is much better when compared with bone grafts surgery.

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