

Evaluation of 23 Cases of Atrophic Posterior Mandible Treated with the Technique of Lateralization of the Inferior Alveolar Nerve for the Installation of Implants

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Abstract

The aim of this study is to evaluate the technique of lateralization of the inferior alveolar nerve for the installation of implants in the posterior mandible.

Patients who needed rehabilitation with implants in the posterior region of the mandible and did not have enough amount of vertical bone for the installation of fixations were submitted to the technique of lateralization of the inferior alveolar bone. The success of implant osseointegration, time of parenthesis of the inferior alveolar nerve and the level of satisfaction of patients submitted to the technique were evaluated.

Twenty-one patients were submitted to 23 surgeries with the technique. Forty-eight implants were installed and they all showed primary osseointegration. The average time of paresthesia was 3.3 months after surgery, and after 16 months only 3 patients showed neurosensorial deficiency. The level of satisfaction with the technique was 90.4%, and only 2 patients were dissatisfied.

The study allows us to conclude that, despite morbidity, the technique of lateralization of the inferior alveolar nerve shows high levels of success and patient satisfaction.

Keywords: Dental Implants; Inferior Alveolar Nerve; Atrophic Mandible; Paresthesia.

Introduction

The rehabilitation of the posterior region of atrophic mandible poses a great challenge to implantodontics, as vertical alveolar resorption associated to the presence of the inferior alveolar nerve limit the installation of conventional size fixations and in many cases even the installation of short fixations is impossible[1-3].

In such situations it is necessary to apply advanced procedures that allow recovering the lost alveolar bone or changing the position of the vascular-nervous bundle permitting the installation of the fixation at an ideal position. Osteogenic distraction, or positional or interpositional grafting, and the lateralization of the inferior alveolar nerve are alternative techniques that allow the rehabilitation of the posterior region of atrophic mandible[3].

Despite the disadvantage of causing damage to the inferior alveolar nerve, the lateralization technique is faster as compared to other techniques, as it allows the installation of implants during the same surgery and the installation of big and well-positioned fixations, thus facilitating prosthetic rehabilitation and, above all, improving the biomechanical results[1,2,4,5].

In this study, the authors present a sequence of 23 cases treated with the technique in which primary Osseo integration, time of paresthesia and satisfaction of patients submitted to treatment with the technique of lateralization of the inferior alveolar nerve were observed.

Methods

Ethics Committee

The study was approved by Opinion 071/2008 of the Ethics Committee of Unesc/Joaçaba, according to Resolution CNS 196/96.

Selection of Patients

Patients submitted to the installation of Osseo integrated implants through the technique of Lateralization of

the Inferior Alveolar Nerve, treated from September 2003 to July 2007 at the IPENO Institute in Florianópolis, and were evaluated considering the analysis of the patients' clinical records. The surgeries were performed by students at the course on Lateralization of the Inferior Alveolar Nerve, at the IPENO Institute.

The techniques applied included mental foramen and post foramen, depending on the need of each treatment.

Surgical Technique

The surgical technique consists of vertical and horizontal osteotomy to allow access to the mandibular medullary bone. The medullary bone is removed with proper curettes until the inferior alveolar nerve is exposed. Then a tape is placed around the vascular-nervous bundle to allow its handling so as to cause as little trauma as possible. The implants are installed following the traditional technique. After the installation of the fixation, a solution with Diprospon applied to the first layer of the vascular-nervous bundle. The wall removed to allow access to the nerve is reconstructed with an organic bovine bone and a membrane of bovine collagen covers the graft.

The patients were advised to come to the Institute twice a week for one month for applications of intra and extra oral laser in the region.

Evaluation of Results

When the implants were reopened (4 to 6 months after surgery) the patients were questioned on how long they felt dormancy or if they still felt any dormancy in the region of the surgery and if they were satisfied with the treatment. Those patients that still showed dormancy were monitored monthly until they stopped complaining.

Data from clinical records and the patients' answers were catalogued and inserted into a specific Table.

Results

From September 2003 to July 2007, 21 patients were submitted to the installation of implants through the technique of lateralization of the inferior alveolar nerve. Twenty-three surgeries were performed, and two patients received bilateral treatment with the technique. Data on such surgeries are in Table 01.

Table 01: Individual Results for Time of Paresthesia and Satisfaction.

Patient	Number of Implants	Time of Paresthesia	Patient Satisfaction
1	1	3 weeks	Satisfied
2	2	9 months	Dissatisfied
3	3	10 months (L.E. and L.D.)	Dissatisfied
4	2	9 months	Satisfied
5	2	2 weeks	Satisfied
6	3	4 months	Satisfied
7	2	4 months	Satisfied
8	2	2 months	Satisfied
9	2	Not shown	Satisfied
10	5	Nor shown	Satisfied
11	2	3 months	Satisfied
12	2	4 months	Satisfied
13	2	Nor shown	Satisfied
14	4	3 months (L.S.), 16 months (R.S.)	Satisfied
15	2	3 months	Satisfied
16	2	3 weeks	Satisfied
17	2	2 months	Satisfied
18	2	2 months	Satisfied
19	2	4 months	Satisfied
20	2	1 month	Satisfied
21	2	3 weeks	Satisfied

(L.S.)- Left side (R.S.)- Right side

Patients' ages ranged from 38 to 65 years old, and the average age was 48.14 years (Table 02). 48 implants were installed in these 23 surgeries; their size and diameter are shown in Table 03.

On reopening surgery all 48 implants were Osseo integrated, resulting in a 100% rate of primary Osseo integration.

Patients reported average time of 3.3 months to recover sensibility; in 3 procedures the patients did not report paresthesia after surgery and in 3 others, dormancy still continued even after 9, 10 and 16 months.

The patients' level of satisfaction with the technique was 90.14%, and only 2 were dissatisfied (Table 02).

Table 02: Results Forage, Number of Implants, Time of Paresthesia and Satisfaction

Age	48.14	38.65
Numberof implants	48	48 success
Timeofparesthesia	3.3 months	0 to 16 months
Satisfaction	19 satisfied 2 dissatisfied	90.14%

Table 03: Size of Implants Installed

Size of implants	Number of implants
10 x 3.25	01
10 x 3.75	04
11.5 x 3.75	10
11.5 x 4.0	04
13 x 3.5	01
13 x 3.75	03
13 x 4.0	14
15 x 3.75	06
15 x 4.0	05

Discussion

The posterior region of the maxilla poses one of the greatest difficulties for the installation of Osseo integrated implants. The deficiency due to physiological resorption and the presence of the inferior alveolar nerve are the main reasons for such difficulty [1,3].

Literature describes several surgical options as alternatives to solve vertical deficiency in the maxillary region. Short implants have shown excellent results in longitudinal works [6-10]. Despite the high rate of success, there are some limitations, as they have minimum bone height and width for the installation of the fixation around 7,5mm and 6mm respectively [6,10].

Block grafting also shows good levels of success, but the vertical gain achieved is limited and there are

considerable complications [11-14]. One alternative is sandwich grafting, which, despite diminishing the level of success, presents greater technical difficulty to be performed and also presents limited vertical gain [15,16].

The osteogenic distraction technique allows considerable vertical gain, but it presents high levels of complications as compared to other techniques [17,18], and it also requires high levels of patient cooperation.

Guided bone regeneration technique is also described as an alternative for mandibular vertical gain [19,20]. An advantage of such technique is the installation of implants in one only surgery, thus decreasing treatment time [21,22]. A disadvantage is the technical difficulty noticed mainly when handling the soft tissue, thus leading to the exposition of the drafting with the loss of some parts of it and, in some cases, loss of the implant that was installed [11,21,22].

The technique of lateralization of the inferior alveolar nerve, regardless the neurosensorial trauma inherent to the technique, is a good choice for the treatment of cases in which there is insufficient height for the installation of fixations [1-4]. Despite the morbidity reported, there are advantages such as the possibility of bigger fixations and shorter treatment time, as the fixations are inserted in the same surgery without the need of bone grafting [1,2].

Restraints to the use of the technique are the surgeon's lack of experience with the technique, as well as the patient's acceptance of the risks of paresthesia or mandibular fracture [2].

The technique is seldom prescribed by implantodontists mostly due to the risk of paresthesia. Although it is almost always present, it is a transitory disturbance, as sensibility is completely recovered in 95% of cases, and only 1% of cases show permanent paresthesia and 4% show diminished sensibility [4].

As compared to the prevalence of neurosensorial disturbance in conventional techniques for the installation of implants, we understand that the difference is not so significant, as the rate in conventional surgeries ranges from 36 to 37% [23] and the recovery of neurosensorial function happens within 4 months after the trauma [24].

Our study corroborates the efficiency of the technique, as all 48 implants showed successful Osseo integration.

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With regard to paresthesia of the inferior alveolar nerve, the results showed average time of 3.3 months and only 1 out of 21 patients had complaints 16 months after the treatment.

Our study used the patients' complaints as parameters for the control of paresthesia, for; regardless the level of paresthesia shown in other tests, the greatest difficulty met in dental clinics is the patient's complaint. Similar parameters have been used by other researchers to evaluate paresthesia following mandibular orthognathic surgery [25,26].

We could also notice that, although all patients were aware of the risks inherent to the technique, some patients who still presented paresthesia were not satisfied with the treatment. Some researchers have stated that the patients' emotional aspect must indicate cooperation in case of failure or complications resulting from the technique as well as the patient's awareness of possible risks she or she will undertake [4].

Conclusions

- 1- The implants installed had 100% primary Osseo integration.
- 2- The average time of paresthesia reported by the patients was 3.3 months, and only 3 patients showed paresthesia in the last control.
- 3- From 21 patients, only 2 were dissatisfied with the treatment.

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