HISTOLOGICAL AND HISTOMORPHOMETRIC ASSESSMENT OF TOOTH BORNE MANDIBULAR DISTRACTION OSTEONEOSIS

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INTRODUCTION

The distraction osteogenesis (DO) is the biological process of new bone formation between segments gradually separated by traction. The basic principles of this technique were suggested by Codvilla (1905) but it was Ciliavir in the 50s who widely applied this technique in long bones with predictability. In 1992, McCarthy used DO for mandibular lengthening in patients with congenital facial deformities and since then this technique has been accepted as an effective treatment option. Although the rate of DO can influence the whole process, there are few experimental studies on the effect of this parameter on the quality and quantity of new bone.

OBJECTIVES

To evaluate the histological and histomorphometric effects in new bone of two different rates of canine mandible distraction osteogenesis, using a tooth-borne distractor.

MATERIALS AND METHODS

10 Beagle dogs were used, weighing between 15-18kg. 7 were submitted to the protocol of distraction and 3 remained as a control group. Both hemi-mandibles were used for experimental purposes, forming the following groups: Group A: 6 mandible remained as control group, Group B: 7 were subjected to two daily activations of 0.5 mm, with an interval of twelve hours; Group C: 7 were subjected to a 1 mm single daily activation. After the distraction period, the distractors were blocked, and submitted to a consolidation period of 12 weeks. Histological and histomorphometric evaluation of bone tissue formed within distraction gap was performed.

RESULTS

CONCLUSION

The results show that increasing the rate of distraction of 1 to 2 daily activations produces changes in quantity and structural quality of newly formed bone, as evidenced by frequent situations of bone non-union and large areas of cartilage / fibrocartilage in group C, compared to group B. Moreover, the preservation of the lingual periosteum seems to be favorable for bone formation.

CLINICAL IMPLICATIONS

This study infers that DO can be effective for the correction of mandibular deficiencies and that continuous distraction seems to be more favorable for bone formation rather than a single daily activation.

BIBLIOGRAPHY

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