

SPEED THRILLS BUT DOES IT REALLY KILL?

THE EFFECT OF OSTEOTOMY AT TWO SPEEDS ON PERIPHERAL BONE: A HISTOPATHOLOGICAL ANALYSIS

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Introduction

The methods of osteotomies are evolving continuously aiming at minimising the invasiveness of the surgery and allowing more precise cuts. The main concern in bone cutting is the mechanical and heat related damage to the bone tissue induced by high-speed cutting tools. Modern techniques of osteotomies like piezotome and hard tissue lasers have reduced the potential for trauma to the adjacent structures. However, due to the increased cost of the equipment and the technique sensitivity of these novel techniques they are not used widely.

Aim

To find out the ideal speed for making a precise osteotomy with minimal damage to the surrounding bone.

Materials and Methods

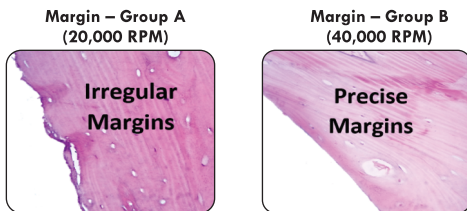
Thirty-six patients with impacted mandibular third molars, were equally divided into two groups depending on the speed of the hand piece used for osteotomy (Group A=20,000 RPM and Group B=40,000 RPM). Post the surgical removal of the impacted tooth, bone samples were taken from the peripheral bone adjacent to the osteotomy site using a trephine. The obtained bone samples were examined histologically to measure the margins of the osteotomy, the amount of debris produced, and the degree of thermal osteonecrosis.

Results

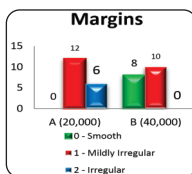
The osteotomy made with the high-speed handpiece was better than that made with the low speed one on all counts. The margins in the high-speed group were more or less precise, with less debris and no thermal necrosis, which illustrated the efficacy of a high-speed osteotomy.

Conclusion

Though there is an advent of newer instruments for osteotomy like piezotome and hard tissue lasers, rotary instruments still remain the most commonly used modality for osteotomies in maxillofacial surgery. This can be attributed to its ease of use and low cost. However, a clear understanding about the safe use of this instrument, knowledge about its effect on bone along with the skill of a surgeon is what determines the quality of care provided for the patient. This histological study shows high speed drills have a unique advantage over lower speed drills. These findings can apply to other procedures that involve osteotomies in maxillofacial surgery.

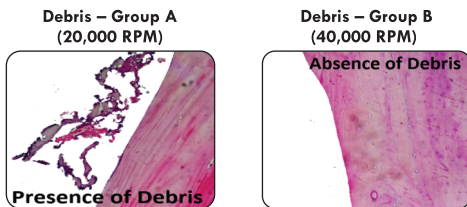


Graph 1: Margin Scores of Both The Groups

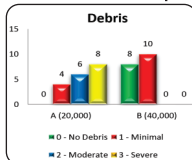


Chi-Square Tests

	Value	df	Asymp.Sig. (2-sided)
Pearson Chi-Square	14.182 ^a	2	.001
Likelihood Ratio	19.590	2	.000
Linear-by-Linear Association	13.720	1	.000
N of Valid Cases	30		

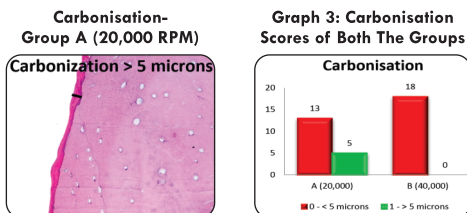


Graph 2: Debris Scores of Both The Groups

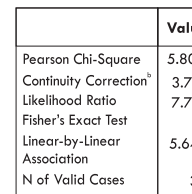


Chi-Square Tests

	Value	df	Asymp.Sig. (2-sided)
Pearson Chi-Square	24.571 ^a	3	.000
Likelihood Ratio	33.155	3	.000
Linear-by-Linear Association	21.575	1	.000
N of Valid Cases	36		



Graph 3: Carbonisation Scores of Both The Groups



Chi-Square Tests

	Value	df	Asymp.Sig. (2-sided)	Exact Sig. (2-side)	Exact Sig. (2-sided)
Pearson Chi-Square	5.806 ^a	1	.016		
Continuity Correction ^b	3.716	1	.054		
Likelihood Ratio	7.741	1	.005		
Fisher's Exact Test				.045	.023
Linear-by-Linear Association	5.645	1	.018		
N of Valid Cases	36				

Conflict of interest None

Reference

A. Pearlcid Siroraj et al, (2016) Extraction of impacted mandibular third molars - the effect of osteotomy at two speeds on peripheral bone: a histopathological analysis, British Journal of Oral and Maxillofacial Surgery, Volume 54, Issue 4, Pages 449-453.