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Clinical and Radiographic Evaluation of Two Newly Pulp Medicaments Used in Primary Molars Pulpotomy

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Introduction

Primary molars pulpotomy is a very common therapy for primary molars with extensive caries. Many agents including formaldehyde-based materials, electro surgery, lasers, glutaraldehyde, haemostatic medicaments, zinc oxide eugenol, bone morphogenic protein (BMP), collagen and calcium involving, Dentin Bridge inducing materials have been developed. However, the ideal pulpotomy treatment still needs to be improved, so this research was done.

Aim

To evaluate clinically and radiographically the effect of (Biodentine and Mineral Trioxide Aggregate) as pulpotomy medicament agents *vs.* Formocresol in primary molars.

Design

The design groups are divided according to Split Mouth design so, the number of control group was 30 primary molar and the two experimental groups (Bio dentine, MTA) was 15 primary molar for each. The 3 groups were divided randomly without any bias and written content was taken from their parents for participating acceptance. All teeth were examined both clinically and radio graphically according to Coll and Sadrian Criteria for 3,6,9 months expect 2 cases did not come the last follow up.

Criteria of Coll and Sadrian

Clinical criteria

No pain on percussion on recall checkup.

No gingival swelling or sinous tract 6 months postoperatively.

No purulent exudate expressed from the gingival margin.

No abnormal mobility of tooth.

Radiographic criteria

No pathologic root resorption

A furcation radiolucency resolved 6-12 months postoperatively

No periapical radiolucency formation postoperatively

Sixty carious primary molars, followed pulpotomy indications, for 17 child were used in this study. The teeth were divided into 3 groups

- Group I (Control group) 30 molar treated by Formocresol
- Group II (Experimental group) 15 molar treated by Biodentine
- Group III (Experimental group)15 molar treated by MTA

Patients preparation, profound local anesthesia, isolation by rubber dam was done then the whole caries was removed, all of undermined enamel was removed, the whole coronal pulp was amputated by sharp spoon excavator, initial stabilized clot was established [1-3], then the various pulp medicaments were applied over the pulp stump, so the pulp was treated by group I (formocresol), group II (Bio dentine), group III (MTA). Final restoration was performed with composite [4-6]. Then, both clinical and radiographic evaluation was done for all teeth at 3,6,9 months according to Coll and Sadrian Criteria. The data were analyzed to obtain Descriptive statistics and Analytical statistics to test the significance of difference between groups (Figure 1 and Table 1).

Results

The results of this study showed that no significant difference in between Biodentine and MTA in the three periods of follow up (P>0.05) on the other hand there was a statistically significant difference between biodentine and its control group (P<0.05) and between MTA group and its control group (P<0.05).

	n=17	%
Age (years)		
Mean ± SD	5.53 ± 1.07	
Sex		
Male	8	47.1
Female	9	52.9

Table 1: Demographic characters of studied groups.

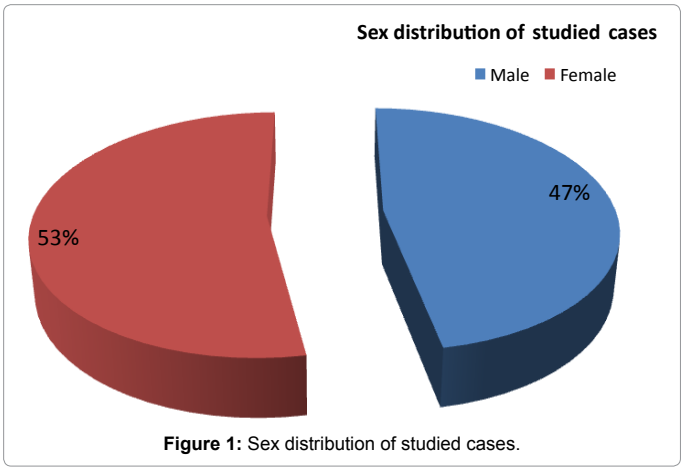

Figure 1: Sex distribution of studied cases.

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Period of follow up	Clinical assessment	Groups			Chi-square test
		Biodentine group	Control	MTA	
		n (%)	group	group	
			n (%)	n (%)	
3 months	pain	0 (0.0)	1 (3.3)	0 (0.0)	p=0.6
	Gingival Swelling	0 (0.0)	1 (3.3)	0 (0.0)	p=0.6
	Purulent exudates	0 (0.0)	1 (3.3)	0 (0.0)	p=0.6
	Abnormal mobility	0 (0.0)	1 (3.3)	0 (0.0)	p=0.6
6 months	pain	0 (0.0)	5 (16.7)	2 (13.3)	p=0.25
	Gingival Swelling	0 (0.0)	3 (10.0)	1 (6.7)	p=0.45
	Purulent exudates	0 (0.0)	3 (10.0)	1 (6.7)	p=0.45
	Abnormal mobility	0 (0.0)	2 (6.7)	0 (0.0)	p=0.36
9 months	pain	2 (14.3)	6 (21.4)	2 (14.3)	p=0.78
	Gingival Swelling	0 (0.0)	3 (10.7)	1 (7.1)	p=0.56
	Purulent exudates	1 (7.1)	4 (14.3)	1 (7.1)	p=0.75
	Abnormal mobility	0 (0.0)	2 (7.1)	0 (0.0)	p=0.36

Table 2: Three groups at 3,6,9 months follow up clinical assessment.

Period of follow up	Radiographic evaluation	Groups			Chi-square test
		Biodentine group	Control	MTA	
		n (%)	group n (%)	group n (%)	
3 months	Pathological Root Resorption	0 (0.0)	1 (3.3)	0 (0.0)	p=0.6 χ^2=1.02
	Furcation radiolucency resolved6-12 months postoperatively	0 (0.0)	1 (3.3)	0 (0.0)	p=0.6 χ^2=1.02
	Periapical radiolucency formation	0 (0.0)	1 (3.3)	0 (0.0)	p=0.6 χ^2=1.02
6 months	Pathological Root Resorption	0 (0.0)	3 (10.0)	1 (6.7)	χ^2=1.02 p=0.4
	Furcation radiolucency resolved6-12 months postoperatively	1 (6.7)	4 (13.3)	1 (6.7)	p=0.69 χ^2=0.7
	Periapical radiolucency formation	0 (0.0)	2 (6.7)	0 (0.0)	p=0.35 χ^2=0.7
9 months	Pathological Root Resorption	2 (14.3)	5 (17.9)	2 (14.3)	p=0.94 χ^2=0.13
	Furcation radiolucency resolved6-12 months postoperatively	0 (0.0)	3 (10.7)	1 (7.1)	p=0.45 χ^2=1.6
	Periapical radiolucency formation	0 (0.0)	3 (10.7)	0 (0.0)	p=0.2 χ^2=3.17

χ^2=Chi-square test.
p value significant if <0.05.

Table 3: Three groups at 3,6,9 months follow up Radiographic evaluation.

Statistical results: These two tables show the comparison between the 3 groups both clinically and radiographically at 3,6,9 months follow up (Tables 2 and 3).

Conclusion

Both MTA and Biodentine can be considered as a great substitute to Formocresol as pulp medicaments after pulpotomy.

Future Aspects

The clue for future about primary molars treatment after surgery. I really recommend the use of MTA and Biodentine as a great substitute to Formocresol as many researches proved that it is mutagenic and carcinogenic.

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