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Pulpotomy in the Primary Teeth: Comparison of Four Techniques

M. Altinawi^{*}

Abstract

The purpose of this study was to evaluate the success of Formocresol pulpotomy compared with Ferric sulfate and Electro coagulation and Laser pulpotomy in primary teeth. Forty seven primary second molars of children aged 5-8 years, were divided randomly into four groups: 10 Formocresol , 13 Ferric sulfate , 13 Electro coagulation, 10 Laser.

All teeth were filled with ZOE and sealed with Compomer, and S.S.Crown as final restoration.

The success rate was 90 % - 84.6 % - 84.6 % - 83.3 % respectively.

These differences were not statistically significant ($p=0.05$), but there were a relation between the pretreatment physiologic resorption of roots and the type of hemorrhage during the amputation procedure.

This study revealed that Ferric sulfate, and Electro coagulation, and Laser pulpotomy are good alternative to Formocresol pulpotomy.

Key word: Formocresol, ferric sulfate, Laser, Electro coagulation.

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⁽⁶⁾1991

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1987 Fischer

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1960

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 ZOE : - :
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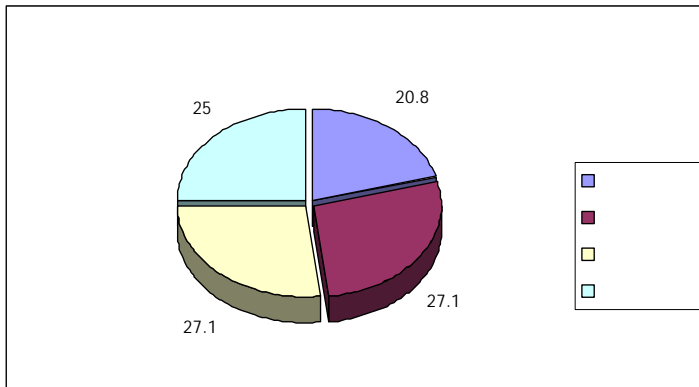
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25	12	
100	48	

(1)



(1)

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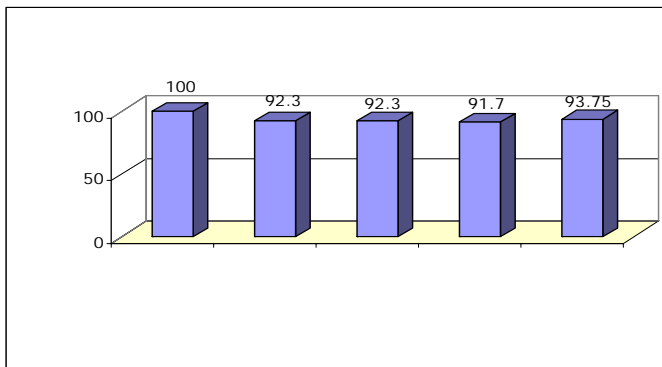
%92.3

%100

%91.7 - %92.3 -

100	100	0	10	10	0	
100	92.3	7.7	13	12	1	
100	92.3	7.7	13	12	1	
100	91.7	8.3	12	11	1	
100	93.75	6.25	48	45	3	

(2)



(2)

: Kruskal – Wallis

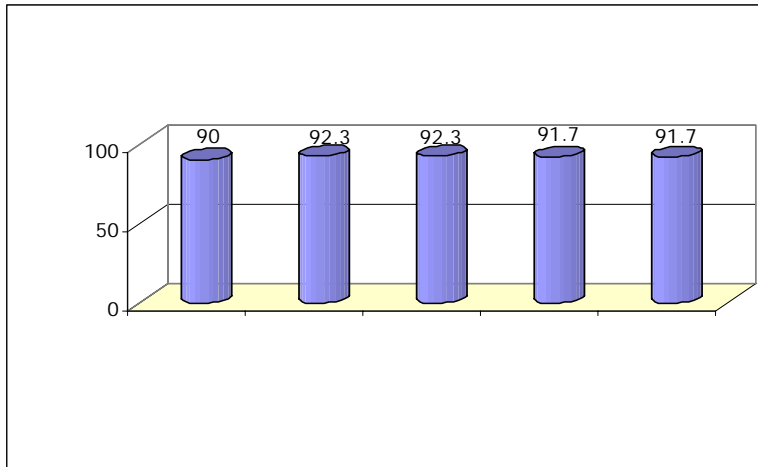
	0.842	3	0.830	48	

Kruskal Wallis (3)

-%92.3 -%92.3 -%90
 . %91.7 0.05
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 ,
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100	90	10	10	9	1	
100	92.3	7.7	13	12	1	
100	92.3	7.7	13	12	1	
100	91.7	8.3	12	11	1	
100	91.7	8.3	48	44	4	

(4)



(3)

: Kruskal – Wallis

	0.997	3	0.049	48	

Kruskal Wallis

(5)

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0.05

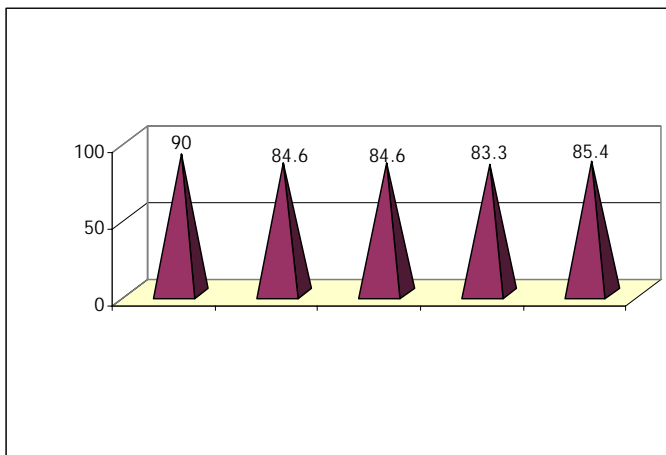
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%95

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%83.3 %85.4

100	90	10	10	9	1	
100	84.6	15.4	13	11	2	
100	84.6	15.4	13	11	2	
100	83.3	16.7	12	10	2	
100	85.4	14.6	48	41	7	

(6)



(4)

: Kruskal – Wallis

	0.974	3	0.219	48	

Kruskal Wallis (7)

Garcia 0.05
 1984 (12) Godoy %95
 1989 (42) Prakash

Wright and Widmer :
 1982 (3) Boeve 1979(42)
 %80 :
 %87
 %85.4
 %92.3 %92.3 %90 100%
 /2/ /1/

4

Fuks

(2) Aktoren 1997

.1998

Electrocoagulation

%92.3

%92.3-

(31) Ruemping

/2/

ZOE

%96

(35) Shulman

ZOE

1987

Morton (34) Sheller

.%56

1998 (11) Fulkerson

1987

(35) Shulman

1996 (7) Fishman

%54.4 %56

1978(33) Schroder

1993

Dean (18) Mack

.%99.4

5

%91.7

/2/

2005 ⁽³²⁾Saltzman

MTA

Dean Mack

.%72

IRM

Er.YAG

1996 ⁽⁴⁰⁾Wilkerson

Dean Mack

J/cm2 24.88

Swine

ZOE

J/cm2 49.74

1987

Cox

⁽²³⁾ Pashley

ZOE, IRM 1988

2003 ⁽¹⁴⁾Kimura.y

Er.YAG

mj/pulse ,102 ,68 ,34. 2Hz

%91.7

Er.YAG

for 15 Sec

10 9

102 68

. mj/puls

1978⁽⁴¹⁾ Woehrlen

%100

.1998 ⁽¹⁾ Ahn

Schroder1997

%80

6Fei

McDonald

2000 ⁽²⁰⁾

Conclusion

Sunada

1991⁽³⁶⁾

**Suggestions
and Recommendations**

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⁽⁴³⁾Yacobi

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Reference

- 1.Ahn,J., Porger,M.A, The effects of lidocaine with 1:100.000 epinephrine on pulpal and gingival .Blood flow , OralSurg. Oral Med. Oral Path. Vol.85;No.2;P:197;1998.
- 2.Aktoren,O. Ferric sulfate, Glutaraldehyde and Formocresol pulpotomies in primary teeth. J. Dental.Research, Vol.77;1998.
- 3.Boeve,V.M, Dermaut,L.R, Formocresol pulpotomy in primary molars : A long term radiographic evaluation, ASDC;49(4);P:191;1982.
- 4.Cox,C.F, et al, Biocompatibility of surface-sealed dental material against exposed pulp, J. Prost. Dent, Vol.57;No.1;P:10;1987.
- 5-DerryC. Formocresol and ferric sulfate have similar rates in primary molar pulpotomy. Evid Based Dent. 2005; 6(3):70.
- 6.Fei,A.L.”A clinical study of ferric sulfate on a pulpotomy agent in primary teeth,Pediatric dentistry,13:6,327-332,1991.
- 7.Fishman,S.A.;Udin,R.D.Success of electro-Fulguration pulpotomies covered by zinc oxide and eugenol or calcium hydroxide, 18;5,385-390,1996.
- 8.Fischers,D;Tissue management: A new solution to an old problem, J. dent, vol 35 p.178,1978.
9. Fuks,A.B; Pulp therapy in pedodontics, “Oral surg;34:2, 293-309,1972.
- 10.Fuks,A.B..Holan,G;Davis,J.M; Ferric sulfate versus dilute formocresol in pulpotomized primary molars. Long-term follow up , pediatric Dentistry ,19:5,327-330,1997.
- 11.Fulkerson,B.T, Dean,J.A, Mack,R.B, Prospective comparison of electrosurgical and formocresol pulpotomy procedures, J. Dent. Res, Vol.77;(abstract#1327),1998.
- 12.Garcia Godoy,F. Direct pulp capping and partial pulpotomy with diluted formocresol in primary molars. Acta. Odonto. Pediat, Vol.5; No.2: P: 57; 1984.
- 13.Holan, G.Fuks, A.B.”A comperation of pulpotomise using ZOE and KRI paste in primary molars : A Retrospective study , Pediat. Dent. 15:6.p403,1993.

14. Kurumada, F. A study on the application of Ga-As Semiconductor laser to endodontic s. The effect of laser irradiation on the activation of inflammatory cells and the vital pulpotomy, Ohu. Daigaku. Shigakushi, 17,3- P: 233, 1990
15. Kimura Y, Yonaga K, Yokoyama K, Watanabe H, Wang X, Matsumoto K. Histopathological changes in dental pulp irradiated by Er: YAG laser: a preliminary report on laser pulpotomy. J Clin Laser Med Surg. 2003 Dec; 21(6) :345-50.
16. Landau, M.J. and Johnson, D.C. Pulpal response to ferric sulfate in monkeys, J. Dental. research. 67:215 abstr, no 822, 1988.
17. Liu, J.F. Chen, L.R.; and Chao, S.Y. " Laser pulpotomy of primary teeth", Pediatric dentistry, 21:2, 128-129, 1999.
18. Mack, R.B, Dean, J.A, Electrosurgical pulpotomy: A retrospective human study, ASDC, Vol.60;No.2;P:107;1993.
19. Morabito, A; investigation on pulpal periodontal connections in primary teeth, American Society of Dentistry for Children, v.95 no.1, p;55, 1992.
20. Markovic D, Zivojinovic V, Vucetic M. Evaluation of three pulpotomy medicaments in primary teeth. Eur J Pediatric Dent. 2005 Sep; 6(3), 133-138
21. McDonald, R.E. and Avery, D.R. "Treatment of deep caries ,vital pulp exposure, and pulpless teeth, Dentistry for the child and adolescent 7thEd , 2000.
22. Oringes, M.J, Electro surgery in dentistry .2ed Ed. Philadelphia .1975.
23. Pashley, E.L, Tao, L, Pashley, D.H, The sealing properties of temporary filling material, J. Prost. Dent, Vol.60;No.3;P:292;1988.
24. Prakash, C. Chandra, S. Juiswal, J.N. Formocresol and glutaraldehyde pulpotomies in primary teeth. J. Pedodontics, Vol.13;No.4;P:314;1989.
25. Primosch, R.E, "Primary tooth pulp therapy as taught in predoctoral pediatric dental program in the united state " Pediatr. Dent, Vol.19, No.2, 1997, p:118.
26. Ranly, D.M. pulpotomy therapy in primary teeth. New modalities for old rational. Pediatric dentistry, 16:6, 403-409, 1994.
27. Ranly, D.M, Garcia. Godoy, F; Reviewing pulp treatment for primary teeth; JADA, 122, Sept. p:83, 1991.

-
28. Ranly, D.M. Assessment of the systemic distribution and toxicity of formaldehyde following pulpotomy treatment as a pulpotomy agent, *Ped. Dentistry*, vol 11, no 1 1989, p:8
 29. Robert, A. Laser and light amplification in dentistry, *Dental Clinics of North America*. October. 2000.
 30. Robert, J.F. Treatment of vital and non vital primary molar teeth by one stage formocresol pulpotomy: Success and effect upon age of exfoliation. *Int. J. Ped. Dent*, vol.6, p.111, 1996.
 31. Rueming, D.R, Morton, T.H, Anderson, M.W, Electrosurgical pulpotomy in primates, A comparison with formocresol, *Ped. Dent*, Vol.5,; P:514;1983
 32. Saltzman B, Siga M, Clokie C. Assessment of a novel alternative to conventional formocresol –zinc oxide eugenol pulpotomy for the treatment of pulpally involved human primary teeth : diode laser-mineral trioxide aggregate pulpotomy. *Int J Pediat Dent*. 2005 Nov; 15(6):437-47.
 33. Schorder, U.” A 2-years follow up of primary molars , pulpotomized with a gentl technique and capped with calcium hydroxide, *scand.J.Dent-Res* Vol.86,273-278,1978.
 34. Sheller, B. Morton, T.H, Electrosurgical pulpotomy: A pilot study in humans, *J. Endo*, Vol.9;P:189;1987.
 35. Shulman, E.R, Melver, F.T, Burkes, E.J, Comparison of electrosurgery and formocresol as pulpotomy techniques in monkey primary teeth, *Ped. Dent*, Vol.9;P:189;1987.
 36. Sunada, M. Study on the Deciduous teeth pulpitis by the blood picture in the dental pulp, *Shoni, Shikagaku, Zasshi*, (The Japanese J of Pedodontic) 29,1. p11. 1991.
 37. Tagger, E; and Tagger, M.” Pulpal and periapical reactions to glutaraldehyde and paraformaldehyde pulpotomy dressings in monkeys” ; *journal of endodontics*, 10:8,364-371,1984.
 38. Waterhouse, P.J. An investigation of the relative efficacy of buckley’s formocresol and calcium hydroxide in primary molars vital pulp therapy, *British .Dental. J*.188;1,32-36,2000.
 39. Waterhouse, P. J, Formocresol and alternative primary molar pulpotomy medicaments, A review, *Endodontic Dent. Traumatology*, vol.11, No.4, 1995.

40. Wilkerson, M.K, Hill, S.D, Arcoria, C.J, " Effects of the Argon laser on primary tooth pulpotomy in swine". J Clin Laser Med Surg. vol.14, no.1, P:37-42, 1996.
41. Woehrlen, A.e. and Woods,H." Evaluation of techniques and materials used in pulpal therapy based on a review of the literature:part 11". JADA, Vol.6;P:107;1978.
42. Wright,F.A, Widmer,R.P, Pulpal therapy in primary molar teeth: A retrospective study, J. Pedodontics, Vol.3;P:195;1979.
43. Yacobi,R., et al, Evolving primary pulp therapy techniques, JADA, Vol.122;No.2, P:83;1991.

.2005/2/10:

.2005/11/28: