

INTRODUCTION

- Traumatic dental injuries (TDIs) are particularly prevalent during childhood and adolescence with approximately 17.5% of the population having experienced a dental trauma.¹
- TDIs are classified into two groups: coronal injuries and luxation injuries.^{2,3,4}
- The stage of root development (open apices vs. closed apices) changes the course of pulpal therapy treatment.⁵
- Numerous authors have evaluated the long-term success of MTA to create an apical barrier in immature teeth with signs of pulpal necrosis caused by traumatic dental injuries.^{6,7}
- No study has been conducted comparing the success of pulpal therapy in teeth with closed apices and those with open apices following TDIs.

HYPOTHESIS/ OBJECTIVES

Objective

- To evaluate the success of pulpal therapy in the permanent anterior dentition following TDIs.

Hypothesis

- The null hypothesis states that the success of pulp therapy is the same in permanent anterior teeth with open apices and those with closed apices following TDIs.
- The alternative hypothesis states that the success of pulp therapy is higher in permanent anterior teeth with open apices than those with closed apices following TDIs.

MATERIALS & METHODS

- The Electronic Healthcare Records of a total of 169 patients at the University of Illinois at Chicago College of Dentistry Department of Pediatric Dentistry and Endodontics were evaluated and findings were recorded for 175 traumatized anterior permanent teeth (IRB #2022-1292).
- A data collection sheet was used to assess patient's demographics and traumatized tooth information.
- Spearman's rho correlations were run to evaluate variables relationships with successful pulpal therapy outcomes as defined by a lack of symptoms or no need for retreatment at follow-up.
- Significant correlations were evaluated in a logistic regression model.

Inclusion Criteria

- Patients 5 – 16 years old
- Patients in the Department of Pediatric Dentistry of Endodontics at the University of Illinois at Chicago who required pulpal therapy on at least one anterior permanent teeth post-trauma between January 1, 2016 and October 1, 2022

Exclusion Criteria

- Patients older than 16 years or younger than 5 years old
- Patients who experienced TDI to a permanent anterior tooth that did not require pulpal therapy

RESULTS

- The mean follow up was 2.6 months and more than 2/3 of the patients (39.6%) had 12 months follow-up
- About one fourth of the patients (20.9%) with 12 months of follow-up required retreatment
- There was no difference in the success of pulp therapy between the open and closed apices groups.

RESULTS CONTINUED

- Luxation and combination injuries occurred in 54.9% (96/175) of the study sample and coronal injuries occurred in 45.1% (79/175) of the study sample
- Luxation injuries and combination injuries were more likely to be associated with symptoms at follow-up than coronal injuries alone (p<0.05)

Figure 1. Development Characteristics of the Traumatized Tooth (n = 175)

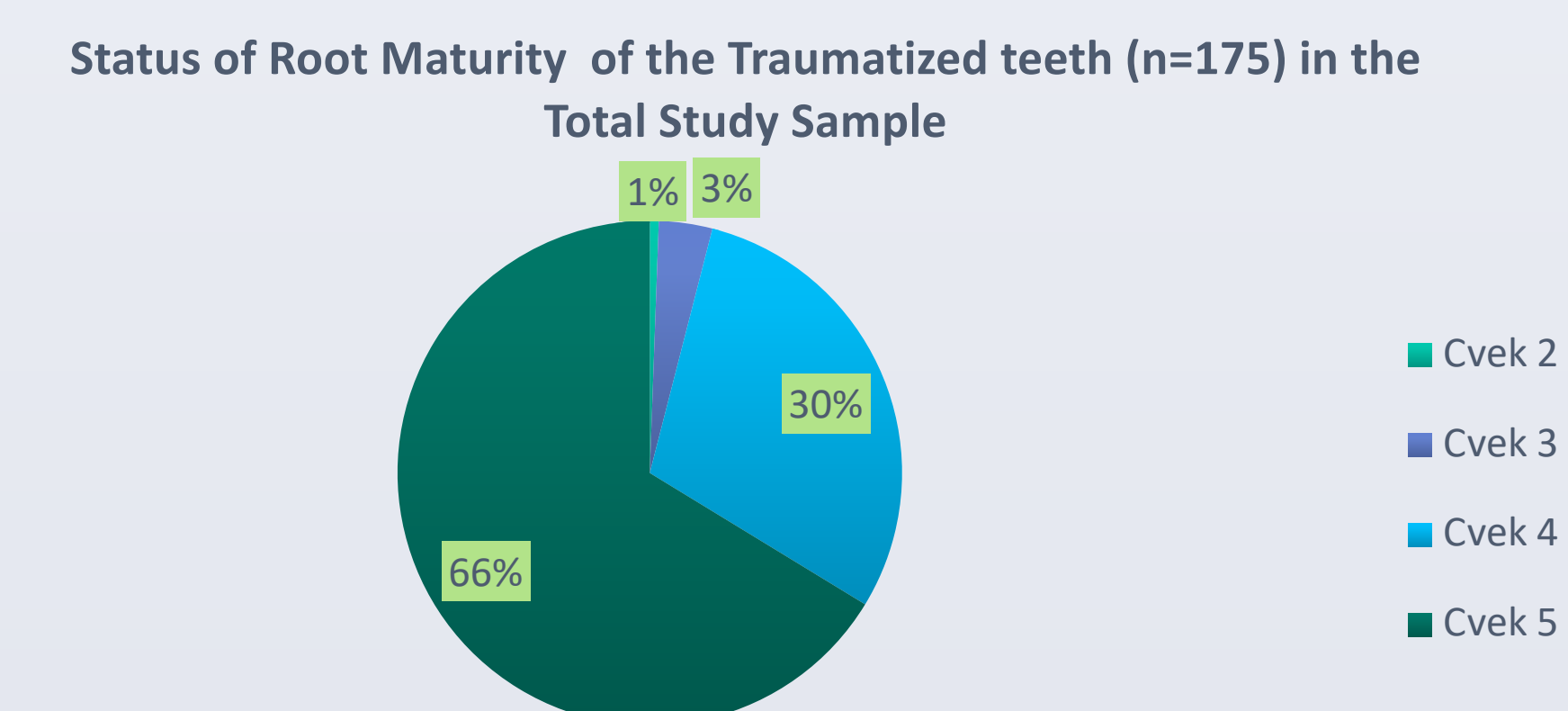


Figure 2. Type of Pulpal Therapy Treatment used for the Total Study Sample (n = 275)

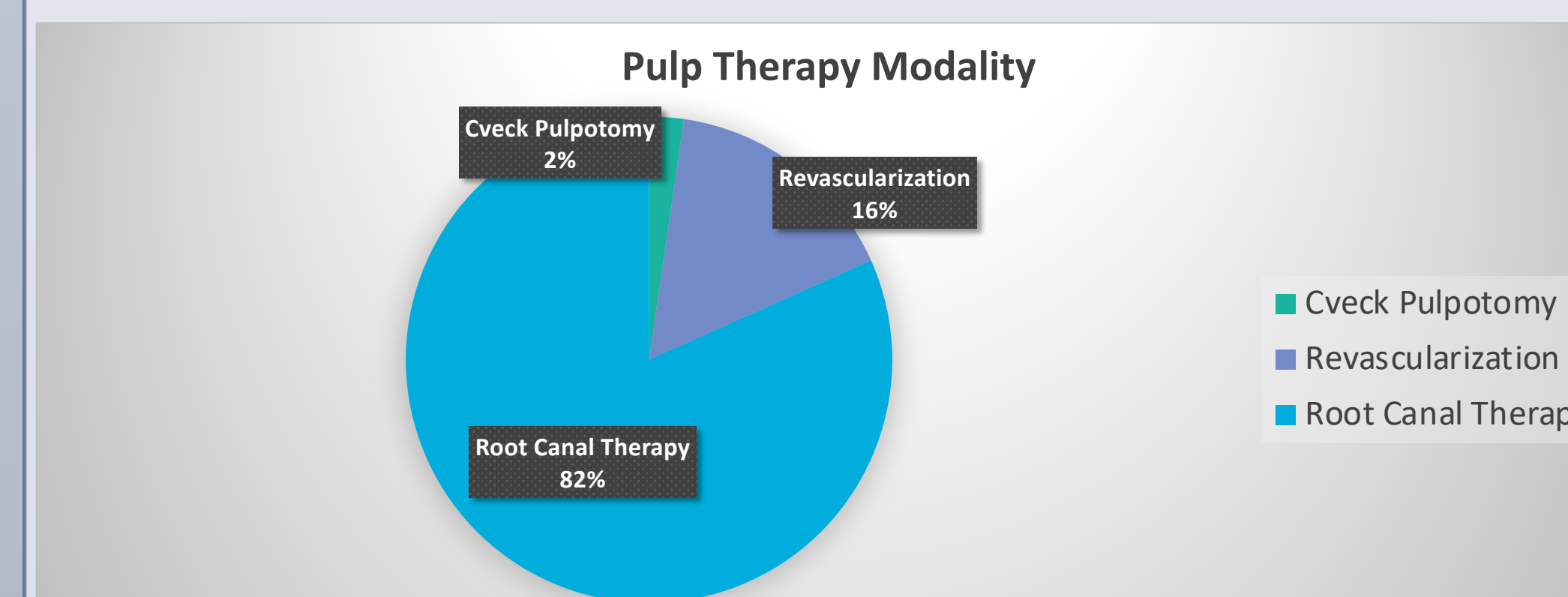


Table 1. Treatment Success Characteristics of the Study Sample (n= 275)

Characteristic	N = 175
Follow-up Interval	
1 month	48 (27.4%)
6 months	18 (10.3%)
12 months	67 (38.3%)
No follow-up	42 (24.0%)
Symptoms at Follow-up	
No Pain	110 (62.9%)
Pain	8 (4.6%)
Mobility	7 (4.0%)
Discoloration	1 (0.6%)
Any Combination	8 (4.6%)
Unknown	41 (23.4%)
Final Restorative Material	
Strip Crown	88 (50.3%)
Composite Filling	46 (26.3%)
Glass Ionomer	37 (21.2%)
IRM/Cavit	4 (2.3%)
Retreatment Needed	
Yes	16 (9.1%)
No	119 (68%)
Unknown	40 (22.9%)

RESULTS CONTINUED

Table 2. Correlations with "Retreatment" as Dependent Variable

Variable	Spearman's Rho
Pain	-0.535*
Root Canal Therapy (RCT)	0.179*
Cvek Pulpotomy	-0.341*

Table 3. Correlations with "No Pain" as Dependent Variable

Variable	Spearman's Rho
Retreatment	-0.535*
Root Canal Therapy (RCT)	-0.86
Luxation vs. Coronal Injury	-0.170*
Pulp Vitality Test Result	0.192*
Avulsion	0.407*

CONCLUSIONS

- Treatment modalities were more important in predicting treatment success rather than tooth maturity in this cohort.
- Disruption of the PDL may result in lower success of pulpal therapy following trauma.
- More studies are required to evaluate pulpal therapy following TDIs with longer follow-up periods.

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ACKNOWLEDGEMENTS

I would like to thank my research committee (Drs. Alrayyes, Tagelsir Ahmed, Kratunova, and Alapati) for their support, encouragement, and generous feedback for my project.