

Introduction

The decision to complete a pulpotomy on primary dentition relies on medical history, dental history, and a dental examination with radiographs. Obtaining a thorough history can assist in determining the vitality of pulp in primary dentition. Pulpal diagnosis can be difficult as there is a lack of clinical tests that can be used for primary dentition.[3,4,6,7] This obstacle may lead to an inaccurate diagnosis of the pulp in primary dentition and therefore questionable prognosis of completed treatment. This study will determine what risk factors are present and if treatment failure is associated with specific risk factors.

Purpose

To compare the outcomes of primary tooth pulpotomies based on treatment modality, pulpal diagnosis, interproximal decay, tooth type, and patient demographics.

Methods

This retrospective cohort study examined pulpotomies on primary teeth that were completed at Hennepin Healthcare between 1/2016 and 12/2021. Pulpotomies were identified via dental code D3220. Electronic medical records were reviewed for the incident and subsequent encounters. Primary endpoints include time to clinical failure and/or radiographic failure. Clinical failure was defined as having symptoms, pathologic mobility, swelling, soft tissue pathology, or early exfoliation; and radiographic failure was defined as having periapical/furcal radiolucency, internal root resorption, or early exfoliation. Data was recorded using REDCap and analyzed using survival analysis methods with time to treatment failure as the outcome. Robust standard errors were used to account for multiple pulpotomies within the same patient. The Institutional Review Board at Hennepin Healthcare approved this study.

Results

We identified 563 pediatric dental patients with dental code D3220 for a total of 790 primary teeth. Of these, we excluded those who did not authorize the use of their information for research, were coded incorrectly, received primary dental care with an outside clinic, or did not have a follow up visit. After exclusions, the cohort contained 435 teeth among 262 patients.

Results cont.

Table 1. Patient Demographics and Hazard Ratios

Characteristic/Risk Factor	N (% of Total)	Hazard Ratio (95% CI)	P-Value
Age Groups (in years)			
1-2	23 (5)	3.11 (1.60-6.03)	0.0008
3-5	314 (72)	Reference	-
6-9	98 (23)	1.58 (0.88-2.83)	0.12
Sex			
Female	200 (46)	1.68 (0.99-2.82)	0.05
Male	235 (54)	Reference	-
Race/Ethnicity			
White	23 (5)	Reference	-
Black	138 (32)	0.69 (0.22-2.21)	0.54
Asian/Pacific Islander	24 (6)	0.52 (0.09-2.91)	0.46
Hispanic	237 (54)	0.68 (0.22-2.09)	0.50
Other/Unknown	13 (3)	1.99 (0.56-7.11)	0.29
Interpreter Needed	280 (64)	0.87 (0.50-1.50)	0.62
Insurance Type			
MA	410 (94)	Reference	-
Private	18 (4)	1.83 (0.80-4.22)	0.16
None/Charity Care	7 (2)	N/A	N/A
Tooth Type			
Second Molar	186 (43)	1.11 (0.70-1.78)	0.65
First Molar	239 (55)	Reference	-
Anterior	10 (2)	1.83 (0.57-5.83)	0.31
Diagnosis			
Normal Pulp	328 (75)	Reference	-
Reversible Pulpitis	88 (20)	1.35 (0.78-2.34)	0.29
Irreversible Pulpitis	19 (4)	0.59 (0.07-4.78)	0.62
Interproximal Caries	228 (52)	1.17 (0.70-1.96)	0.56
Setting			
Operating Room	364 (84)	Reference	-
Dental Clinic	71 (16)	2.06 (1.15-3.71)	0.0155

Pulpotomy medicaments used in this study include ferric sulfate, NeoMTA, and Biodentine.

Results cont.

Figure 1. Kaplan Meier Curve - Age

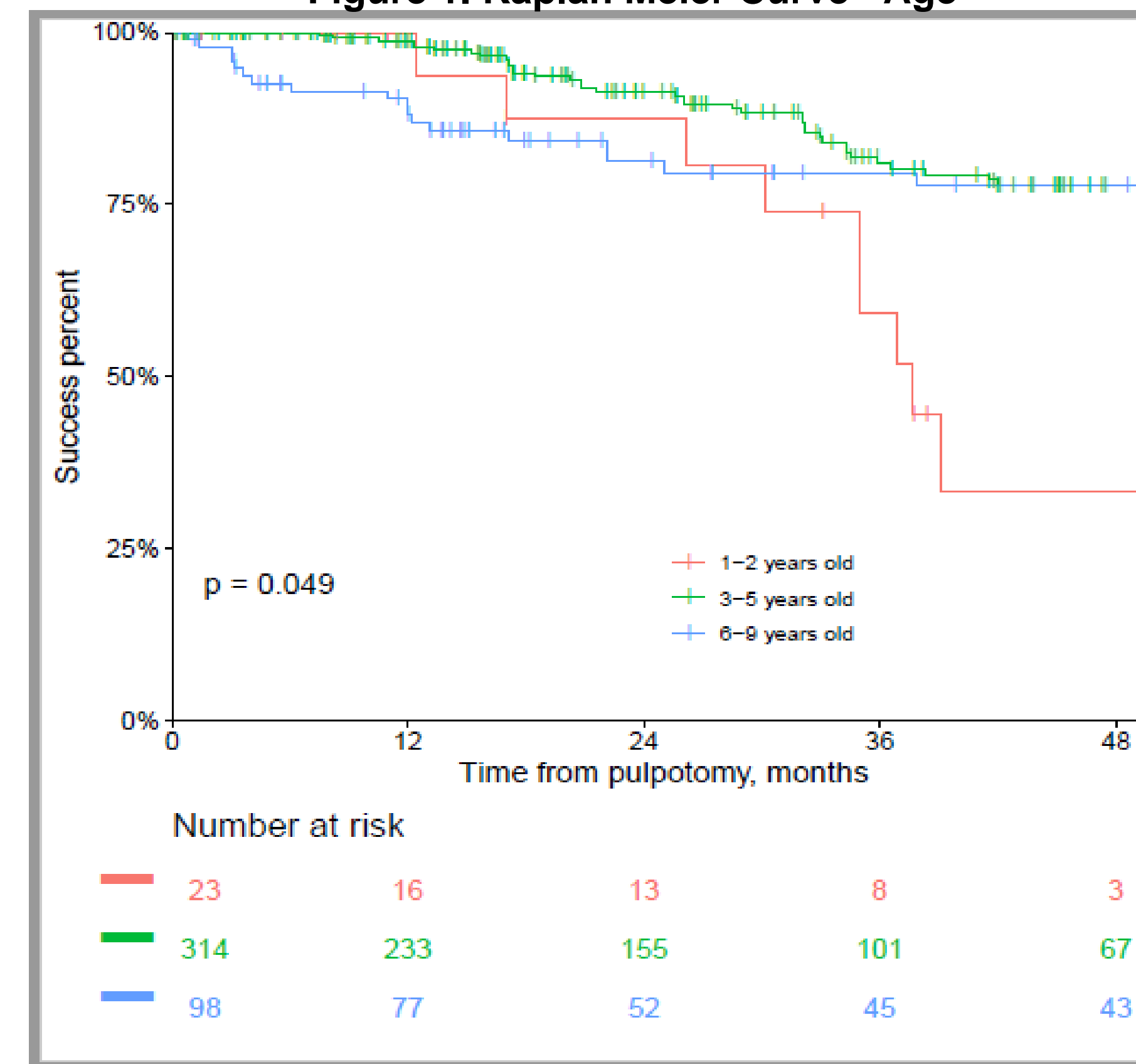
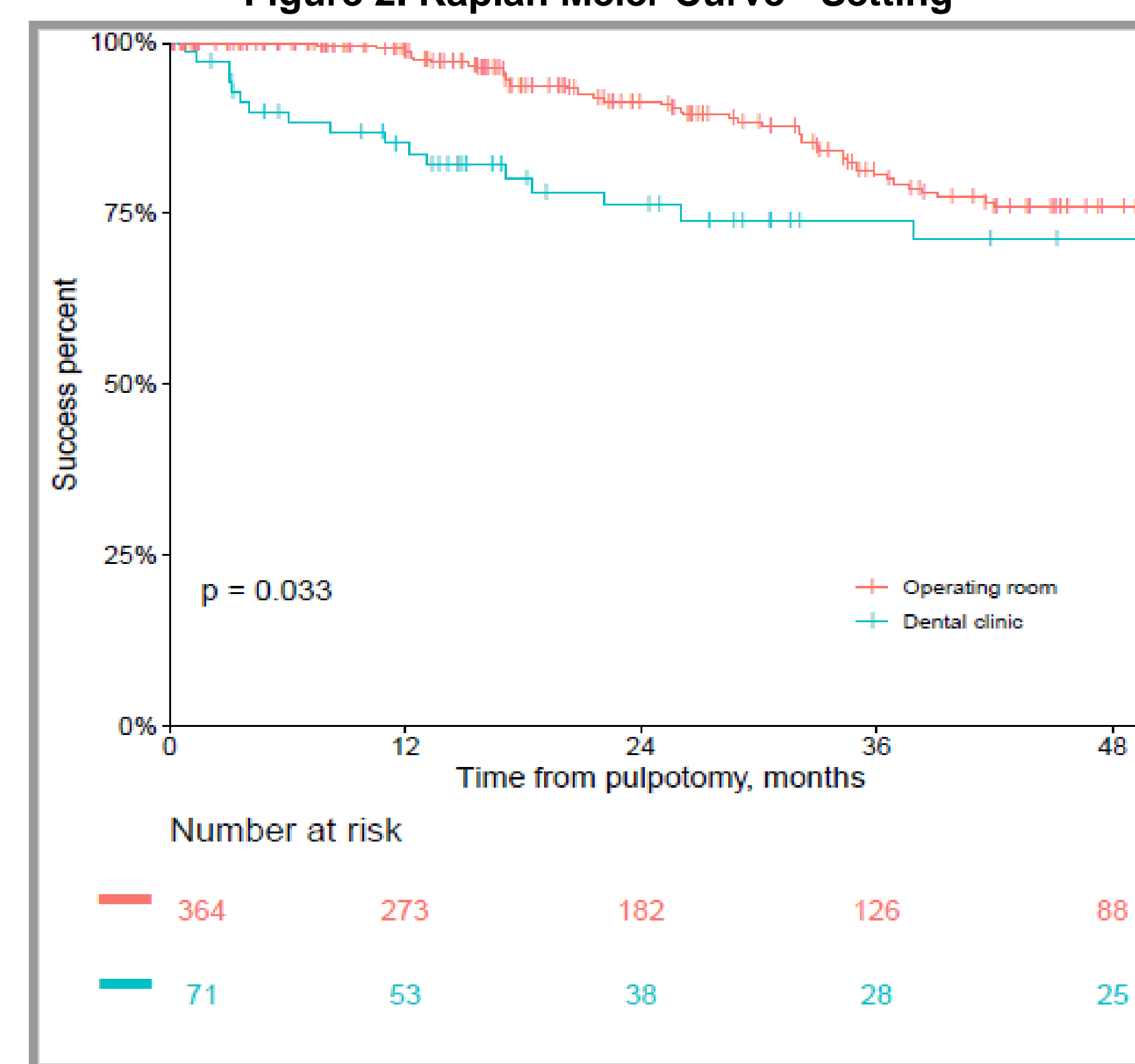


Figure 2. Kaplan Meier Curve - Setting



Discussion

- Pulpotomy failure was associated with age. This result makes sense because pulpotomy success rates decrease with time.
- Pulpotomies completed in the dental clinic were more likely to have treatment failure compared to those performed in the operating room. This result may be due to limited patient cooperation in the clinic leading to poor isolation for the pulpotomy.
- We did not find any statistical significance in associations with race/ethnicity, interpreter need, insurance type, tooth type, pulpal diagnosis, or interproximal caries.

Conclusion

- Pulpotomies completed in children age 1-2 years old have a higher failure rate than pulpotomies completed in children 3-5 years old
- Pulpotomies completed in the dental clinic have a higher failure rate than pulpotomies completed in the operating room

References

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