



Long-term Outcomes of SDF Treated Teeth at NYUCD’s Pediatric Clinic

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Background/Aims

Silver diamine fluoride (SDF) is an effective and minimally invasive method to achieve arrest in cavitated lesions. Treated lesions can increase in size, even though they appear black, so periodic follow up with accurate reporting is important to assess arrest over time.

At New York University College of Dentistry’s Pediatric Clinic (NYUCD-PC), patients are treated by multiple resident providers, overseen by various faculty members. An electronic note template was developed for consistency in reporting of treatment outcomes. It contained lesion’s baseline characteristics, application protocol, and re-application details. It was implemented on October 31, 2023 by the post-graduate residents at the NYUCD-PC on a voluntary basis.

The first aim of this clinical retrospective study was to evaluate the final outcomes of teeth treated with 38% Silver Diamine Fluoride (SDF) at NYUCD-PC. The second aim is to evaluate how age, number of lesions and behavior treated at baseline determine caries arrest on those that return for evaluation.

Methods

A retrospective chart review was conducted by evaluating Electronic Health Records (EHR) of patients at NYUCD-PC who received SDF CDT code D1354 from October 1, 2023 through to March 31, 2025. Data was extracted for age, behavior, lesion size, color, consistency, sensitivity, re-application, provider, post-operative evaluations and final outcomes including: no follow-up visits, arrested, monitor (unarrested), received additional treatment (composite/RMGI, SSC or strip crown, Hall crown, ITR), emergency visit, exfoliated, extraction, planned for definitive restoration, referred to general anesthesia. The follow-up period for patients treated varied from 0 (never returned) to 3 years. Associations were analyzed with descriptive, Mann-Whitney, chi-square and multivariate analysis statistics.

Results

919 lesions on over 250 patients were evaluated. Application times varied from 10 seconds to 1 minute per lesion. Many initial applications were performed prior to the evaluation date range with limited reporting. In approximately 367 lesions (40%) treatment outcome is unknown, as patients did not return for follow-up visits. 174 lesions (18%) required further treatment, 55 (5.9%) were treatment planned for a restoration and 66 (7.1%) experienced an emergency or extraction of the treated tooth and 80 (8%) were referred for GA. (Table 1)

On 131 lesions (arrested/not arrested), variables were analyzed to determine predictors of carries arrest. Mean age at baseline was 4 years with a median of 3.6 years. Around half of the children had more than two lesions, and around one-half experienced carries arrest on at least one lesion. From the 69 arrested lesions, a significant majority attained arrest (71%) by their second visit (only one application). However, 62 lesions did not attain arrest at the last follow-up. (Table 2)

There was no significant difference in the age of those who had attained arrest versus those that had not, and no significant difference was found between these two groups in the number of lesions or behavior. A multivariate logistic regression analysis corroborated these findings; namely, the odds of arrest were not associated with age, number of lesions or behavior. (Table 3)

Table 1:

Final Outcome of Lesions Treated with SDF	Number of Lesions
Arrested	69
Composite or RMGI	39
Emergency Visit (Facial Swelling, Prescribed Antibiotics)	22
Exfoliated	12
Extraction	44
Hall Crown	31
Interim Therapeutic Restoration (ITR)	38
Monitor [Unarrested]	62
No Follow-Up Visits	401
Planned For Definitive Restoration	55
Referred to General Anesthesia	80
Stainless Steel Crown (SSC)	35
Strip Crown	31

Table 2: Descriptive Statistics for the Variables Measured

Variable	Statistic
Age (years)	
Mean (SD), Med	4.08 (1.87), 3.6
Number of lesions	
Mean (SD), Median	2.76 (2.06), 2
Carries arrested? N (%)	
No	62 (47.34)
Yes	69 (52.67)
Visits until arrest, N (%)	
2	49 (71.01)
3	9 (13.04)
4	8 (11.59)
5	3 (4.35)
Behavior, N (%)	
1	45 (34.35)
2	33 (25.19)
3	34 (25.95)
4	19 (14.50)

Table 3: Logistic Regression Model of Predicting Caries Arrest from Age, Number of Lesions and Behavior

Variable	b	SE	OR _a	95% CI OR _a		z	p
				Lower	Upper		
Intercept	-.16	.55	-	-	-	-.29	.773
Age	0.10	.11	1.11	.90	1.38	.94	.346
Number of lesions	-.07	.09	.93	.78	1.11	-.83	.408
Behavior 2	.25	.48	1.28	.50	3.34	.52	.601
Behavior 3	.08	.49	1.08	.42	2.83	.16	.869
Behavior 4	-.19	.59	.83	.26	2.61	-.32	.747

Note: Assumptions of linearity and multicollinearity were tested and they were found to be met.

Discussion

Over 40% of patients are lost to follow-up visits. NYUCD-PC is a safety-net clinic and patients experience barriers to dental care access, or are referred for a specific problem and return to their providers. It is crucial for our providers and patients to take this into consideration when planning treatment.

From 131 lesions, 62% remained unarrested with one application: 20/69 that eventually arrested and, 62 lesions unarrested at the last follow-up. This is consistent with results from Fontana et al 2024. Many lesions require more than one application to achieve arrest. Age, number of lesions or behavior had no impact on odds of arrest in this sample, but limited sample size and accuracy in records of follow-up could be limitations, for example: Patients with extensive treatment needs and lack of cooperative behavior are referred to GA to complete treatment and their follow-up is done at the hospital, their lesions could be arrested or not, but it is not in our records. Similarly, lesions that received further treatment could have been arrested but still required treatment for other reasons.

Conclusions

SDF is a valuable tool for caries management on young children but repeated applications and/or further treatment may be necessary, so it should be stressed to parents the importance of routine follow-up visits for re-evaluation and prevention.

Clinical implications: An accurate informed consent should include realistic expected outcomes for parents to evaluate.

Future research: Improved record keeping of arrest follow-ups should be explored for accuracy of the outcomes, as well as improved protocols to improve caries arrest.