

Predictive Factors for Replantation in Patients with Traumatic Digit Amputations: A 10-Year Review of the National Trauma Data Bank



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INTRODUCTION

- Traumatic digit amputations typically occur in younger patients working in manual labor industries, significantly affecting their lifestyle¹
- Digit replantation rates have precipitously declined in recent years²⁻⁴

Objectives:

- Investigate temporal trends in digit replantation across trauma centers nationally
- Identify factors predictive of attempted replantation following traumatic digit amputation

Hypotheses:

- Rates of digit replantation have continued to decline nationally
- Mechanism of action (MOA) and insurance are implicated in the decision to replant

Figure 1. Temporal Rates of Replantation and Surgical Success

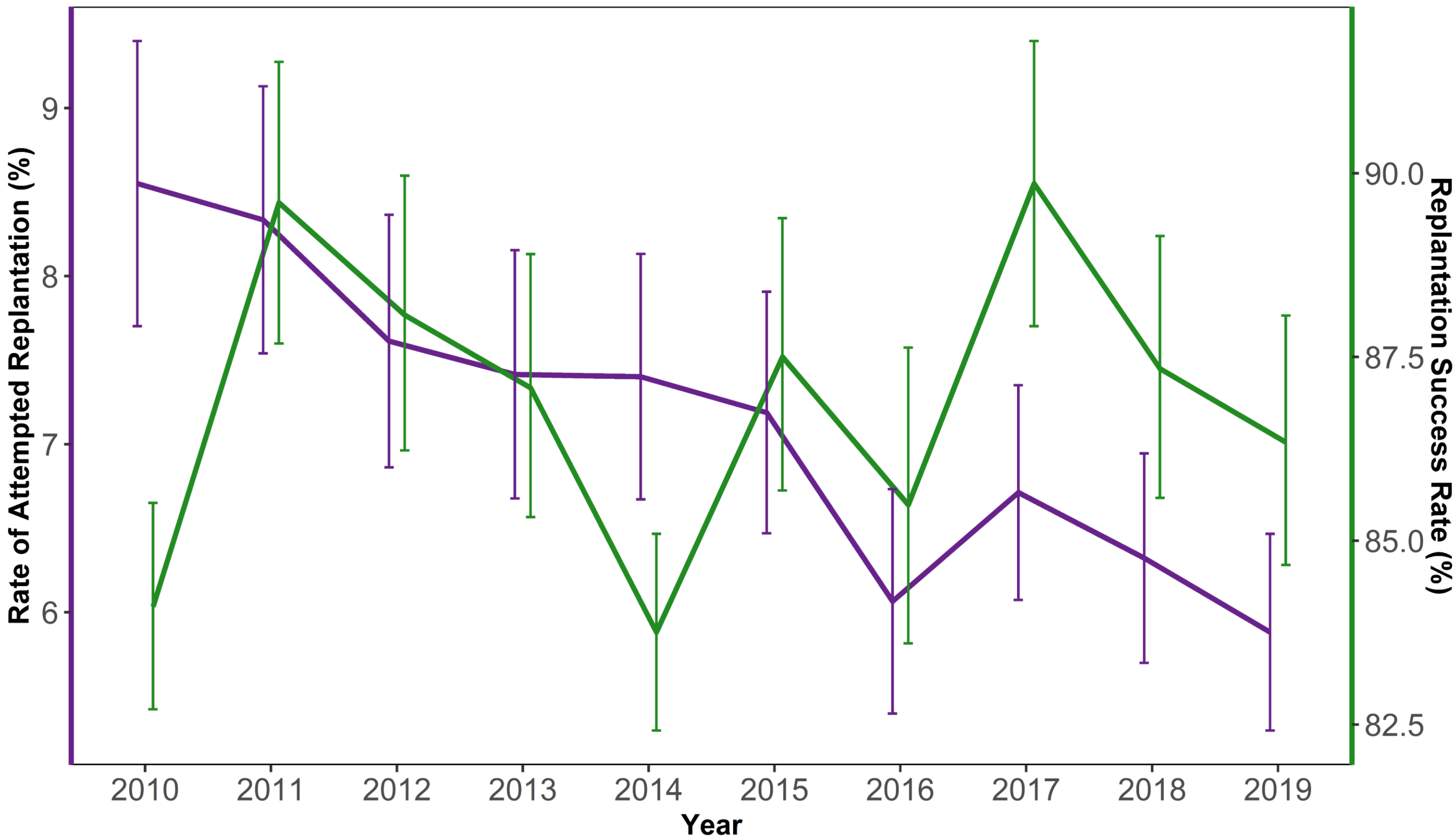


Table 1. Demographic and Hospital Data				
Category	Value	Replantation	No Replantation	p value
Gender	Male	3302	43601	0.45
	Female	594	7575	
Age		36.7	41.1	< 0.001
BMI		27.2	27.6	0.0038
Race	White	2781	36695	0.68
	Black	304	5211	< 0.001
	Asian	82	795	0.0080
	Pacific Islander	10	127	0.92
	Native American	31	377	0.68
Ethnicity	Hispanic/Latino	734	9088	0.12
Hospital Trauma Level	I	2201	20605	< 0.001
	II	453	9991	
	III	42	2281	
	IV	0	85	
Hospital Teaching Status	University	2857	25391	< 0.001
	Community	791	16924	
	Non-Teaching	242	8750	
Length of Admission (Days)		5.8	2.9	< 0.001

Table 2. Multivariate Regression Outlining Factors Predictive of Digit Replantation			
Category	Value	OR	95% CI
Alcohol Screen	Alcohol Present	0.73	0.35-1.36
	Active Smoking	0.83	0.66-1.02
Comorbidities	CHF	0.30	0.02-1.45
	Diabetes	0.88	0.58-1.29
	Hypertension	1.03	0.77-1.37
	Age	0.98	0.98-0.99
Demographics	Hispanic/Latino	0.77	0.61-0.97
	Black	0.84	0.59-1.16
Hospital Trauma Level	Level II	0.50	0.35-0.71
	Level III	0.24	0.07-0.60
Insurance Payment	Out-of-pocket	0.62	0.47-0.80
	Medicare	0.65	0.43-0.96
	Medicaid	1.07	0.77-1.46
Trauma Intent	Assault	0.49	0.16-1.15
	Self-Inflicted	0.35	0.02-1.91
Trauma Mechanism	Motor Vehicle Transport	0.27	0.17-0.42
	Natural/Environmental	0.22	0.09-0.47
	Firearm	0.04	0.00-0.18
	Struck by/against	0.43	0.23-0.75

METHODS

- Dataset: National Trauma Data Bank (NTDB), years 2010-2019
- Inclusion criteria: ICD codes for traumatic digit amputations and reattachment of digits
- Data collected: demographics, comorbidities, emergency department vital signs, trauma MOA

Analyses:

- Pearson correlation coefficients to determine change in replantation rate across 10 years
- Univariate testing for variable progression to multivariate testing (selection threshold p<0.25)
- Multivariate logistic regression to identify factors associated with attempted replantation (p<0.05)

RESULTS

- Cohort size: 55,084 patients with 66,274 amputated digits
- Replantation attempted on 3,896 patients (7.1%) and 4,326 digits (6.5%)
- Significant decline in replantation rates (r = -0.95, p < 0.001), with relatively steady success rates (r = 0.11, p > 0.05)

Descriptive Statistics: Significant differences in patients' age, BMI, race, and length of stay, as well as hospital trauma level and teaching status between replantation and no replantation groups

Multivariate Regression: Older age, Hispanic/Latino ethnicity, and Level II/III trauma centers associated with lower odds of replantation.

Payment out-of-pocket or with Medicare, as well as injuries due to motor vehicles, nature/environment, firearms, and struck by/against associated with lower odds of replantation

DISCUSSION

- American College of Surgeons mandate for microvascular services at Level I trauma centers has had little influence on replantation rates⁵
- Replantation patients are younger, have lower BMIs, present to Level I trauma centers, and have longer lengths of stay
- Consistent with literature data, race, ethnicity, insurance, and hospital characteristics contribute to the decision for replantation or revision amputation^{2,6}

CONCLUSIONS

- One of the largest cohorts of digit replantation data to date
- Rates of replantation have declined, despite a relatively constant success rate
- Ethnic and insurance disparities exist in digit replantation

Future Directions:

- Identify variables predictive of successful replantation in this cohort

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