

Epidemiology of Digital Amputation and Replantation in Taiwan- A Population-Based Study

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Disclosure/Financial Support: None of the authors has a financial interest in any of the products, devices, or drugs mentioned in this manuscript.

INTRODUCTION: Publications on digital amputation and replantation have been mostly derived from case series in high-volume hand surgery practices, and epidemiological studies are few^{1,2}. This study uses a population-based dataset to illustrate the incidence of digital amputation, patient and hospital characteristics, and their relationship with replantation.

MATERIALS AND METHODS: A claim for reimbursement dataset (2008) was provided as a research database by the Bureau of National Health Insurance (BNHI), Taiwan. Patients with ICD-9-CM coded as digital amputation (885 and 886) were included. These were cross-referenced with procedure codes for replantation procedures (84.21 and 84.22). We defined the patients who underwent thumb replantation (84.21) and thumb amputation (84.01) during a single hospitalization as replantation failure. Patient and hospital characteristics were studied with statistical analysis.

RESULTS: 2,358 patients with digital amputation were admitted (1,859 males, 499 females), mean age 39.2±15.5 years old. The incidence rate was 10.2 per 100,000 person-years. The highest incidence rate was 14.7 per 100,000 person-years in the age group between 45-54 years old. 68.8% of digital amputations were caused by machinery and powered hand tools. Thumb amputation (OR:1.35, $p=0.01$), private hospital (OR:1.40, $p=0.01$), medical center (OR:2.38, $p<0.001$), regional hospital (OR:2.41, $p<0.001$) and hospitals with an annual volume > 20 digital amputations (OR:4.23, $p<0.001$) were associated with higher attempt rates for replantation (Table 1, Figure 1). The elder patients (> 65 years old) had higher risks of thumb replantation failure (OR:32.30, $p=0.045$) while the hospitals with annual replantation more than 20 had lower risks (OR:0.11, $p=0.02$).

CONCLUSION: Our study of the NHI database characterizes the epidemiology of digital amputation patients undergoing replantation and the facilities where these procedures are performed in Taiwan. The hospitals treating more digital amputation patients had higher attempt rates and lower thumb failure rates.

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FIGURE LEGEND:

Figure 1. Percentages of replantation and nonreplantation according to annual hospital volume of amputations.

Table 1. Factors Associated with the Odds of Receiving Replantation. ref, Reference group; *only 2 counties belong to suburban area (Hsinchu County and Chiayi County), and we put urban and suburban hospitals into same group in comparison to rural ones.

Table 1. Factors Associated with the Odds of Receiving Replantation

Variable	Odds ratio	95% CI	<i>p</i> value
Sex (ref, female)			
male	1.10	0.88-1.37	0.395
Age (ref, 0-19)			
20-44	0.91	0.66-1.27	0.59
45-64	0.87	0.62-1.23	0.43
>65	0.59	0.35-1.009	0.054
Thumb (ref, fingers)	1.35	1.07-1.70	0.01
Diabetes	0.73	0.41-1.29	0.28
Hospital ownership (ref, public)			
Private	1.40	1.08-1.82	0.01
Hospital level (ref, local hospital)			
Medical center	2.38	1.53-3.7	<0.001
Regional hospital	2.41	1.59-3.66	<0.001
Patients' residency (ref, rural)			
Urban + suburban*	1.037	0.86-1.26	0.71
Hospital yearly amputations (ref:1-5)			
6-10	1.28	0.67-2.46	0.45
10-20	1.44	0.81-2.58	0.22
>20	4.23	2.47-7.26	<0.001

Annual Hospital Volume of Amputations

