Dermabond®, Friend or Foe? A Retrospective Review of Dermabond® Sensitivity in Pediatric Patients

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INTRODUCTION: Dermabond® is a skin adhesive popularized in adult surgery for its low rates of skin sensitivity. As Dermabond® becomes increasingly common in pediatric surgery, differences in pediatric skin sensitivities and wound healing are relatively unknown. Few studies have examined outcomes of Dermabond® exposure in children. The purpose of this study is two-fold: to estimate the rate of skin reactions following Dermabond® exposure in pediatric orthopaedic surgery, and to investigate potential risk factors associated with Dermabond® sensitivity.

METHODS: This was a retrospective chart review of a level one pediatric trauma center. All elective and orthopaedic traumatic surgeries in 2019 were screened for Dermabond® application. We employed a convenience sample of 3 surgeons with the highest rates of Dermabond® application to define our cohort. There were 2,990 surgeries in 2019, and the 3 surgeons performed 495. Of those 495, 234 patients had Dermabond® applied. Patients were assessed for postoperative skin reactions and repeat Dermabond® exposure. Subjects with known allergies to Dermabond® or cyanoacrylate skin adhesives were excluded. Reactions were defined by localized discoloration or irritation, as well as wound dehiscence or discharge. Significant differences in skin reactions between patients with repeat Dermabond® exposure and those without were determined using Chi-squared analysis. Associations between patient and surgical characteristics and skin sensitivity were determined using logistic regression analysis. P-values less than 0.05 were considered significant.

RESULTS: A total of 234 patients were included for analysis. The mean age at surgery was 12.5 years (SD, 6.05) and 39% of the cohort was male (Table 1). Thirty-two patients (14%) experienced skin reactions during the study period (95%CI=7-19%). Reactions most frequently included erythema (31%) and itchiness (31%) (Table 2). Reactions were treated most frequently with oral antibiotics, diphenhydramine, or a dressing change. One patient required surgery. Of 144 patients with a primary Dermabond® exposure, 17 (12%) experienced skin reactions (95%CI=7-18%). Of 128 patients with a repeat Dermabond® exposure, 32 (25%) experienced skin reactions (95%CI=18-32%, p=0.004). Age, surgical procedure, and surgical location were not associated with a variable rate of skin sensitivity.

DISCUSSION AND CONCLUSION: Skin sensitivity to Dermabond® after pediatric orthopaedic surgery occurs at a higher rate than seen in adults. As Dermabond's® popularity increases in pediatric surgery, providers must be aware of increased sensitivity rates. In this study, patients with multiple Dermabond® exposures experienced significantly greater sensitivity than patients at their first exposure, suggesting that providers should be aware of prior Dermabond® exposure. Larger, multicenter study on this topic is needed to identify other risk factors associated with skin sensitivity after Dermabond® application. Dermabond® and other skin adhesives used in pediatric orthopaedic surgery are associated with a moderate risk of skin sensitivity. Increased provider awareness of this potential complication is needed to help justify its application in pediatric orthopaedics.

Table 1. Cohort characteristics (N=234).

Characteristic	Freq.	(%)
Age at surgery (*mean ±SD*)	12.5	± 6.05
Sex (*% male*)	92	(39%)
BMI percentile (*median (IQR); n=173*)*	59	(31-89)
Race (n=166)*		
White	142	(86%)
Black/African American	17	(10%)
Asian	6	(4%)
Native American/Alaskan Native	1	(1%)
Procedure type		
Osteotomy	99	(42%)
Soft tissue	47	(20%)
ORIF	10	(4%)
Other	78	(33%)
Surgical region		
Hip	110	(47%)
Lower extremity	75	(32%)
Upper extremity	29	(12%)
Hand	12	(5%)
Knee	5	(2%)
Spine	1	(0%)
Foot	1	(0%)
Other	1	(0%)
Specialty		
Neuromuscular	103	(44%)
Lower extremity	89	(38%)
Upper extremity	33	(14%)
Trauma	9	(4%)
Previously exposed to Dermabond®	90	(39%)

SD, standard deviation; IQR, interquartile range.
*The number in parentheses represents the number of cases with available data for the given characteristic.

Table 2. Types of reactions experienced after Dermabond® exposure.

	Reactions in 2019 (n=32)		Reactions after 2019 (n=12)	
Reaction type	**Freq.**	**(%)**	**Freq.**	**(%)**
Erythema or redness	10	(31%)	6	(50%)
Itchiness	10	(31%)	5	(42%)
Rash	7	(22%)	4	(33%)
Wound dehiscence	7	(22%)	0	(0%)
Discharge	7	(22%)	2	(17%)
Contact dermatitis	3	(9%)	1	(8%)
Pain	2	(6%)	1	(8%)
Other discoloration	2	(6%)	0	(0%)
Other	13	(41%)	7	(58%)