Dressing-induced Allergic Contact Dermatitis in Total Joint Arthroplasty

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INTRODUCTION:

Various post-operative dressing and tissue sealants are utilized to protect incisions following hip and knee arthroplasty. Some patients may develop allergic contact dermatitis (ACD) despite no prior history of such reactions. This study aims to investigate the incidence and risk factors for ACD following total hip and knee arthroplasty (THA and TKA) for several different dressing and sealants.

METHODS:

A retrospective review was conducted of patients who underwent primary, elective THA or TKA between March 2019 and July 2024 with at least 90 days of follow-up. Allergic reactions to dressings were identified by reviewing medical records for “allergy” diagnoses and use of antihistamines or corticosteroids within 30 days post-surgery. Patient characteristics were compared between those with and without reactions. Additional data on prior exposure, treatment, dressing type, and allergy history were collected.

RESULTS:

Sixty-one (0.26%) of the 23,396 investigated cases developed a dressing-induced ACD. The average time to presentation was 12.2 days. Approximately 41% of patients had some type of documented preoperative allergy, excluding seasonal allergies, and 55.7% were treated with low-dose oral or topical antihistamines and corticosteroids. The majority (41%) of the ACD were associated with mesh-adhesive dressings. Twenty-four (39.34%) of the 61 patients who had an ACD had previously undergone arthroplasty surgery, and 11 (45.83%) of these had been previously exposed to the same type of dressing. Patients who experienced ACD were significantly more likely to have undergone TKA (73.8% vs. 58.3%, p=0.015) and to have never smoked (75.4% vs. 58.4%, p=0.014).

DISCUSSION AND CONCLUSION:

The incidence of dressing-induced ACD following joint arthroplasty is low (0.26%) but remains a frustrating complication, primarily occurring two weeks post-surgery, with mesh-adhesive dressings most frequently implicated. Patients with prior exposure to dressings, those undergoing TKA, and non-smokers are at higher risk. Identifying at-risk patients can guide dressing selection and application.

Table 1. Patient demographics and features.
SD, standard deviation; n, number; %, percentage; BMI, body-mass index; ASA, American Society of Anesthesiologists;

Parameter	Allergic group (n = 61)	Non-allergic group (n = 23,335)
Mean age at surgery ± SD, (years)	67.5 ± 10.7	66.3 ± 10.1
Sex, n (%)		
Male	20 (32.8)	8,846 (37.9)
Female	41 (67.2)	14,489 (62.1)
Mean BMI ± SD, (km/m^2)	31.2 ± 5.8	31.3 ± 28.1
Smoking Status, n (%)		
Never	46 (75.4)	13,623 (58.4)
Former	11 (18.0)	8,371 (35.9)
Current	4 (6.6)	1,341 (5.7)
ASA Score, n (%)		
I	0 (0.0)	978 (4.2)
II	33 (54.1)	13,750 (58.9)
III	28 (45.9)	8,365 (35.8)
IV	0 (0.0)	238 (1.0)
Surgery performed, n (%)		
Knee arthroplasty	45 (73.8)	13,614 (58.3)
Hip arthroplasty	16 (26.2)	9,721 (41.7)
Follow-up time ± SD, (years)	1.2 ± 1.3	

Table 2. Descriptive statistics of the allergic reactions and dressing types used.
NPWT, negative-pressure wound therapy (PICO or Prevena); [1], diagnosis of a previous known allergy to a specific medication, nutrition or latex; ED, emergency department.

[1]Prior allergy diagnosis, n (%)	
Yes	25 (41)
Antibiotics	14 (56.0)
Nutrition	4 (16.0)
Latex	4 (16.0)
Other medication	3 (12.0)
No	36 (59)
Dressing type, n (%) in TKA (K) and THA (H)	
Mesh-adhesive	25 (41.0) in K: 21 (84.0), H: 4 (16.0)
Standard	17 (27.9) in K: 10 (58.8), H: 7 (41.2)
Hydrofiber	11 (18.0) in K: 8 (72.7), H: 3 (27.3)
NPWT	8 (13.1) in K: 6 (75.0), H: 2 (25.0)
Mean time until diagnosis ± SD, (days)	12.2 ± 7.3
Diagnosed with allergic reaction within 30 days, n (%)	55 (90.1)
Yes	4 (7.2)
Same day	8 (14.5)
Within 3 days	13 (23.6)
Within 7 days	33 (60.0)
Within 14 days	6 (9.9)
No	
Clinical presentation, n (%)	
Erythema/eczema	52 (85.24)
Redness	51 (83.6)
Pruritus	35 (57.37)
Papules	10 (16.4)
Swelling	8 (13.11)
Blisters	4 (6.5)
Urticarial rash	3 (4.91)
Medication prescribed, n (%)	
Yes	34 (55.7)
Antihistamines	24 (70.5)
Corticosteroid tablets	21 (61.7)
Corticosteroid creme	6 (17.6)
Decongestant	1 (2.9)
Combination	13 (38.2)
No	27 (44.3)
90-day ED visit, n (%)	
Yes	10 (16.4)
Due to allergic reaction	6 (60.0)
Due to other medical cause	4 (40.0)
No	51 (83.6)

Table 3. Descriptive statistics of the oral medications and dosages prescribed for treating DIACD.
n, number; %, percentage.

Medication		n (%)
Antihistamines	First generation	
	Diphenhydramine	32 (94.1)
	12.5 mg/5 ml	2 (6.25)
	25 mg	24 (75)
	50 mg	6 (18.75
	Hydroxyzine	20 (75.58)
	10 mg	2 (10)
	25 mg	11 (55)
	50 mg	7 (35)
	Second generation	
	Loratadine	9 (26.47)
	10 mg	9 (100)
	Cetirizine	4 (11.76)
	10 mg	4 (100)
	Third generation	
	Fexofenadine	7 (20.58)
	60 mg	4 (57.14)
	180 mg	3 (42.85)
	Desloratadine	2 (5.88)
	5 mg	2 (100)
Corticosteroid	Methylprednisolone	15 (44.1)
	4 mg	15 (100)
	Prednisone	6 (17.64)
	5 mg	1 (16.67)
	10 mg	1 (16.67)
	20 mg	4 (66.67)