

and psychiatrists should be involved in the early stages of treatment.

The limitation of our study is that we could not measure the actual disease duration between psoriasis and the mental health disorders. However, our study was strengthened by the use of standardized, large-population data to identify an association between psoriasis and mental health disorders.

The present results demonstrate that psoriasis is associated with a higher risk for developing mental health disorders; therefore, dermatologists should play a role in detecting mental health disorders in patients with psoriasis, and in assembling a multidisciplinary team of medical professionals to treat these patients.

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Frequency of Contact Allergy to Implanted Cardiac Devices

Allergic contact dermatitis associated with implanted cardiac devices is rare. This study evaluates patients who underwent cardiac implant patch testing.

Methods | This retrospective study used data from a preexisting database repository and was approved by the Duke University Health System Institutional Review Board, which also provided waiver for individual consent. Adult patients who underwent cardiac implant patch testing from March 1, 2012, to September 15, 2017, at Duke University School of Medicine's Department of Dermatology were included. Data from patch test results were recorded in REDCap.¹

Allergens were obtained from Chemotechnique (Sweden), Allergeaze (SmartPractice Canada), and cardiac device companies. Allergens were applied on Finn Chambers (SmartPractice USA) with Scanpor Tape (Norgesplaster; Norway). Readings were completed on D2 and D4/D5 in accordance with International Contact Dermatitis Research Group criteria.² Relevance was designated as definite, probable, possible, past, or unknown.³

Results | Of the 11 patients who completed 15 patch test sessions, the mean (SD) age was 58.4 (15.6) years, and 3 (27%) were women. Six patients had pacemakers implanted, and 5 patients had implantable cardioverter defibrillators implanted. Clinical characteristics are summarized in **Table 1**. Common indications for patch testing were concern for allergy, skin eruption, skin symptoms, and concern for infection. Common symptoms included pruritus and pain. Erythema was noted at the implant scar in 8 patients (72.7%).

Table 2 summarizes device data and patch test results.⁴ Eight patients (72.7%) underwent device extraction. Duration of device implantation prior to extraction was 1 to 77 months if extracted before patch testing and 1 to 11 months if extracted after patch testing. Six patients (55%) had relevant positive patch test reactions, and 4 (36%) of these included reactions to metals. Other positive patch test results included reactions to rubber accelerators, lidocaine, silicone, and a device-related dexamethasone plug. Six patients underwent device extraction prior to patch testing, and 1 patient underwent extraction 4 months after patch testing. Patient 2 underwent extraction prior to the first negative patch test result; a new device was placed, and symptoms recurred. Additional testing revealed relevant allergens, but an alternative device could not be identified. Treatment with maintenance prednisone was required to avoid recurrent reaction.

Culture data were available for 7 patients who underwent extraction (**Table 1**). Five cultures had negative results. Based

Table 1. Clinical Characteristics

Patient No. ^a	Indications for Patch Testing ^b	Clinical Symptoms ^c	Clinical Examination Results ^d	Culture Results
1-1	Concern for allergy Wound dehiscence Poor wound healing	No symptoms	Normal examination	No culture data
1-2	Concern for allergy Skin eruption Wound dehiscence Poor wound healing	No symptoms	Erythema at implant site Diffuse dermatitis	No culture data
1-3	Concern for allergy Wound dehiscence Poor wound healing	No symptoms	Normal examination	No culture data
2-1	Concern for allergy Skin eruption Skin symptoms Concern for infection	Fever Pain Pruritus	Erythema at implant site Edema at scar	Blood culture results negative ×4 Fluid culture negative for bacteria Tissue culture negative for bacteria
2-2	Concern for allergy Skin eruption Skin symptoms Concern for infection	Pain	Erythema at implant site Hematoma	Blood culture results negative ×4 Tissue culture negative for mycobacteria, bacteria, and fungus
2-3	Concern for allergy Skin eruption Skin symptoms Concern for infection	Pain	Erythema at implant site Hypertrophic scar	Skin swab negative for bacteria
3	Concern for allergy Skin eruption Skin symptoms Concern for infection	Burning Pain Pruritus	Erythema at implant site Hypertrophic scar	Pocket culture negative for bacteria ×2 Lead tip culture negative for bacteria Tissue culture negative ×2 for mycobacteria, bacteria, and fungus
4	Concern for allergy Concern for infection Incision-site drainage	No symptoms	Psoriasis	Blood and skin swabs negative for bacteria
5	Concern for allergy Skin eruption Skin symptoms Concern for infection Incision-site drainage Wound dehiscence	Pain	Erythema at implant site	Blood culture results negative ×2 Pocket fluid culture negative for bacteria Pocket swab culture negative for bacteria Tissue culture negative ×2 for bacteria
6	Concern for allergy Skin eruption Concern for infection Incision-site drainage Poor wound healing	No symptoms	Erythema at implant site	Blood culture results negative ×2 Bacterial culture results negative ×3
7	Concern for allergy Skin eruption Skin symptoms Concern for infection	Pain Pruritus Warmth at scar	Erythema at implant site Edema at scar	Blood culture results negative ×4 Rare growth coagulase-negative <i>Staphylococcus epidermidis</i> Pocket swab culture positive for <i>Propionibacterium acnes</i> but negative for fungus Tissue rare growth coagulase-negative <i>S epidermidis</i> , positive for <i>P acnes</i> , and negative for fungus
8	Concern for allergy Skin eruption Skin symptoms	Pruritus	Diffuse dermatitis	Culture not obtained
9	Concern for allergy Skin eruption Skin symptoms	Pruritus	Diffuse dermatitis	Culture not obtained
10	Concern for allergy Skin eruption Skin symptoms	Irritation Pruritus Sensitivity	Erythema at implant site Diffuse dermatitis	Culture not obtained
11	Concern for allergy Skin eruption Skin symptoms Concern for infection	Pain Pruritus	Erythema at implant site Edema at scar	Negative culture results outside of hospital Pocket tissue culture negative ×4 for fungus and mycobacteria Tissue from roof of pocket culture negative for mycobacteria, bacteria, and fungus Tissue from pocket culture negative ×3 for bacteria and positive for one colony coagulase-negative staphylococcus Chest swab culture negative for bacteria and fungus Atrial lead tip positive for coagulase-negative staphylococcus Ventricular lead tip culture negative for bacteria

^a Eleven patients completed 15 patch test sessions. Patients 1 and 2 had 3 patch test sessions each, owing to the need for additional testing.

^b Total indications for patch testing: concern for allergy (n = 15 [100%]), skin eruption (n = 12 [80%]), skin symptoms (n = 10 [67%]), concern for infection (n = 9 [60%]), wound dehiscence (n = 4 [27%]), poor wound healing (n = 4 [27%]), and incision-site drainage (n = 3 [20%]).

^c Total clinical symptoms: pruritus (n = 7 [47%]), pain (n = 7 [47%]), none (n = 5 [33%]), and 1 (7%) case each of burning, irritation, sensitivity, low-grade fever, and warmth at scar.

^d Total results of clinical examinations: erythema at scar (n = 10 [67%]), diffuse dermatitis (n = 4 [27%]), edema at scar (n = 3 [20%]), hypertrophic scar (n = 2 [13%]), and hematoma (n = 1 [7%]).

on clinical impression, patient 7 had a true infection, and patient 11 had a secondary infection. With one exception, electrophysiologists avoided relevant allergens during reimplan-

tation. The duration of success after reimplantation ranged from 11 to 36 months. As of September 15, 2017, one patient had died, and the remainder of the patients' devices were

Table 2. Device Data and Patch Test Results

Patient No. ^a	Status of Device on Presentation	Duration of Device Prior to Extraction	Duration of Device Prior to Patch Testing	Duration of Device Stability After Reimplantation	Allergens Tested	Relevant Positive Patch Test Results (Relevance)
1-1	Extracted	No data	No device during patch test	No data	Modified ACDS, ^b metals, company A cardiac test kit	Cobalt, carba mix, n,n-diphenylguanidine, vanadium (III) chloride, manganese (III) chloride, silver nitrate (possible)
1-2	Extracted	No data	No device during patch test	No data	Company A cardiac test kit, mastisol, steri-strip, curity sponge gauze, 4-0 polyglactin 910 undyed suture with 2% lidocaine	4-0 Polyglactin 910 suture with lidocaine and epinephrine (possible) ^c
1-3	Extracted	No data	No device during patch test	No data	3-0 Polyglactin 910 undyed suture, 3-0 V-Loc violet suture, 4-0 V-Loc undyed suture, 4-0 poliglecaprone 25 undyed suture, 4-0 polydioxanone clear suture, 5-0 polysorb undyed suture, 0 silk black suture, bupivacaine 0.5% with no epinephrine and no preservative, lidocaine 2% with no epinephrine + methylparaben preservative	2% Lidocaine (definite) ^c
2-1	Extracted	3 mo	Temporary pacemaker during patch test	18 mo	Modified ACDS, ^b metals, company A cardiac test kit	None
2-2	Device in place	Not extracted	1 mo	18 mo	Modified ACDS, ^b metals, plastics and glues, company A and company B cardiac test kits	Company A: silicone rubber MDX-70, silicone rubber ETR-50, silicone rubber Med4719, barium sulfate-filled silicone rubber MDX-70, silicone rubber medical adhesive (probable); company A: complete pacemaker (definite); company B: silicone-based cured medical adhesive, dexamethasone plug (possible)
2-3	Device in place	Not extracted	3 mo	18 mo	Company B cardiac test kit	None
3	Device in place	12 mo	8 mo	36 mo	Modified ACDS, ^b metals, company B cardiac test kit	Nickel sulfate, sodium tetrachloropalladate hydrate (possible)
4	Extracted	2 mo	No device during patch test	NA	Modified ACDS, ^b cardiac implant	None
5	Extracted	11 mo	Temporary pacemaker during patch test	21 mo	Modified ACDS, ^b cardiac implant, company A cardiac test kit	Carba mix, n,n-diphenylguanidine (possible)
6	Extracted	1 mo	No device during patch test	NA	Modified ACDS, ^b cardiac implant, company A cardiac test kit	None
7	Extracted	19 mo	No device during patch test	11 mo	Cardiac implant	Manganese (III) chloride, cadmium chloride (possible)
8	Device in place	Not extracted	5 mo	NA	Modified ACDS, ^b percutaneous cardiac device, cosmetic and personal care products	None
9	Device in place	Not extracted	11 mo	NA	Modified ACDS, ^b select fragrance, company A cardiac test kit, personal care products	None
10	Device in place	Not extracted	Not known	NA	Modified ACDS, ^b cardiac implant, select fragrance, select custom allergens	None
11	Extracted	77 mo	No device during patch test	No data	Modified ACDS, ^b metals, plastics and glues, company A cardiac test kit	Company B: silicone-cured medical adhesive (probable); zinc (possible) ^d

Abbreviations: ACDS, American Contact Dermatitis Society; NA, not applicable.

^a Eleven patients completed 15 patch test sessions. Patients 1 and 2 had 3 patch test sessions each, owing to the need for additional testing.

^b Modified ACDS panel is based on the ACDS Core 80 allergen series.⁴

^c Lidocaine reactions included erythematous edematous papule followed by cutaneous necrosis with a diameter of 1 to 2 cm. Hemorrhagic crust persisted

for more than 3 months. Injection of lidocaine for local anesthesia during cardiac device placement is suspected to have resulted in a severe local adverse reaction that placed the patient at risk for chronic inflammation, difficulty healing, and risk of infection, and ultimately required device removal.

^d Results are from a previous patch test.

functioning as expected. In comparison, of the 5 patients with negative patch test results, 3 patients kept their devices, which demonstrated that the negative patch test result had important diagnostic value. The remaining patients had their devices extracted prior to testing, and reimplantation was not indicated.

Discussion | This study included 11 patients who underwent cardiac implant patch testing. The majority of patients had history of erythema at the implant site. Concern for infection was common, and more than half of patients had devices extracted prior to presentation. Culture results, with 2 exceptions, were negative.

More than half of the patients had relevant positive patch test results, and the most common allergens were metals, rubber accelerators, and silicone. Cardiac device allergy to metals, silicone-based components, and thiuram rubber accelerators has been published previously.⁵ To our knowledge, there are previous reports of allergy to carbamate rubber accelerators, diphenylguanidine rubber accelerators, and lidocaine, though not in the setting of cardiac devices. The majority of patients with relevant positive patch test reactions underwent device extraction and successful reimplantation. In a majority of cases, electrophysiologists were able to avoid allergens. For those patients in which we have follow-up data, new cardiac devices were functioning well.

One limitation of this study is the lack follow-up data for 2 subjects. In addition, the duration of follow-up was limited to a maximum of 36 months. Cardiac device allergy should be considered when there is clinical concern for infection, history of device extraction, history of erythema at the implant site, or negative culture results. When cases are identified, positive outcomes may be obtained when allergen-guided reimplantation is performed. Contact allergy to cardiac devices is an uncommon but important phenomenon.

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OBSERVATION

Oral Tofacitinib Treatment of Erosive Pustular Dermatitis of the Scalp

Erosive pustular dermatitis of the scalp (EPDS) is an inflammatory dermatosis characterized by pustules, erosions, and crusting that can lead to cicatricial alopecia. Often, EPDS has a prolonged and undulating clinical course refractory to topical tacrolimus, isotretinoin, and photodynamic therapy.^{1,2} The cause of EPDS is poorly understood, but there are 2 common theories: autoimmune response and trauma.¹ Previously, EPDS has been noted in patients with concurrent autoimmune conditions, including rheumatoid arthritis (RA), Hashimoto thyroiditis, autoimmune hepatitis, and Takayasu aortitis.³ We report a case in which oral tofacitinib was successful in the treatment of EPDS.

Report of a Case | A 70-year-old woman presented with a 12-month history of an enlarging tender plaque of the scalp. Examination findings were notable for dark serosanguinous crust, purulent discharge, and scarring alopecia involving the vertex of the scalp (Figure, A). The lesion began as a quarter-sized erosion that enlarged gradually.

The patient's medical history was notable for uncontrolled rheumatoid arthritis. No history of trauma to the scalp was identified. A punch biopsy specimen taken from the edge of the ulcer showed a mixed dermal inflammatory infiltrate with perifollicular microabscesses and giant cell reaction. Direct immunofluorescence findings were negative, and tissue cultures were negative for bacteria and fungus. Zinc level was normal. The patient was clinically diagnosed as having EPDS, and treatment with topical clobetasol, 0.05%, ointment and tacrolimus, 0.1%, ointment were started along with vinegar soaks. Concurrently, treatment with injections of certolizumab pegol was initiated by her rheumatologist for management of worsening RA.

Improvement was noted during topical therapy, but, 3 months later, the condition of the scalp vertex worsened,