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A mysterious rash around surgical wounds



A 15-year-old boy presented with a new-onset pruritic, papulovesicular rash 3 weeks after a minimally invasive pectus excavatum repair using a metal bar. The rash initially appeared on his upper extremities and chest wall around his surgical incisions (Fig 1A). Later, new erythematous lesions occurred on the penile foreskin. The patient denied systemic symptoms or history of metal or medication allergies.

Surgical removal of the bar was initially contemplated because allergic reactions to the components in stainless steel, primarily nickel, have been well documented in pectus excavatum repair surgery¹ and seemed most likely in this case. Nonetheless, a 5-day course of oral prednisone 30 mg by mouth twice daily led to resolution of the rashes (Fig 1B).

A blood metal–lymphocyte transformation test (LTT) (Orthopedic Analysis, IL) did not show reactivity to nickel, cobalt, chromium, iron, molybdenum, vanadium, or zirconium. Skin patch testing (PT) was negative to nickel (T.R.U.E. TEST, SmartPractice, Denmark) and metal discs provided by the manufacturer of the surgical bar, and positive to Dermabond adhesive (Ethicon, NJ) (Fig 1C), confirming a diagnosis of allergic contact dermatitis (CD) to Dermabond. Patch testing was not done for other materials used during the operative procedure, including chlorhexidine, drape (3M Ioban 2 Incise Drape) and suture materials (FiberWire, Vicryl, and Monocryl).

Contact dermatitis related to surgical exposure is often caused by a direct irritant effect of medical products or a delayed-type hypersensitivity to agents including topical medications, surgical instruments, and tissue adhesives (TA).² Tissue adhesives are often used for smaller incision closures and laparoscopic procedures, because they help to improve approximation of wound edges and enhance healing. The 3 main components of TA that can cause allergic reactions are cyanoacrylates, plasticizers, and dyes. Cyanoacrylates and their derivatives are highly reactive molecules that polymerize and rapidly bind to the stratum corneum. The 2 most common cyanoacrylates in TA used in the United States are 2-octyl cyanoacrylate (Dermabond) and 2-butyl cyanoacrylate (Indermil or Histoacryl). Allergic CD to Mastisol Liquid Adhesive (Eloquest Healthcare, MI), an adhesive used on intact skin for adhering tapes, dressings, and devices, has been reported.³ Unlike TA, Mastisol Liquid Adhesive contains gum resin, styrax liquid, methyl salicylate, and alcohol without cyanoacrylates or their derivatives.

Contact dermatitis from TA usually presents with pruritis and erythematous infiltration, papules, vesicles, or bullae at the surgical incision site occurring 5 to 14 days after TA application. Autoeczematization or id reaction, characterized by a widespread eruption and pruritus at remote areas, may occur.⁴ Patch testing can be used to confirm Dermabond-induced CD diagnosis, although the test

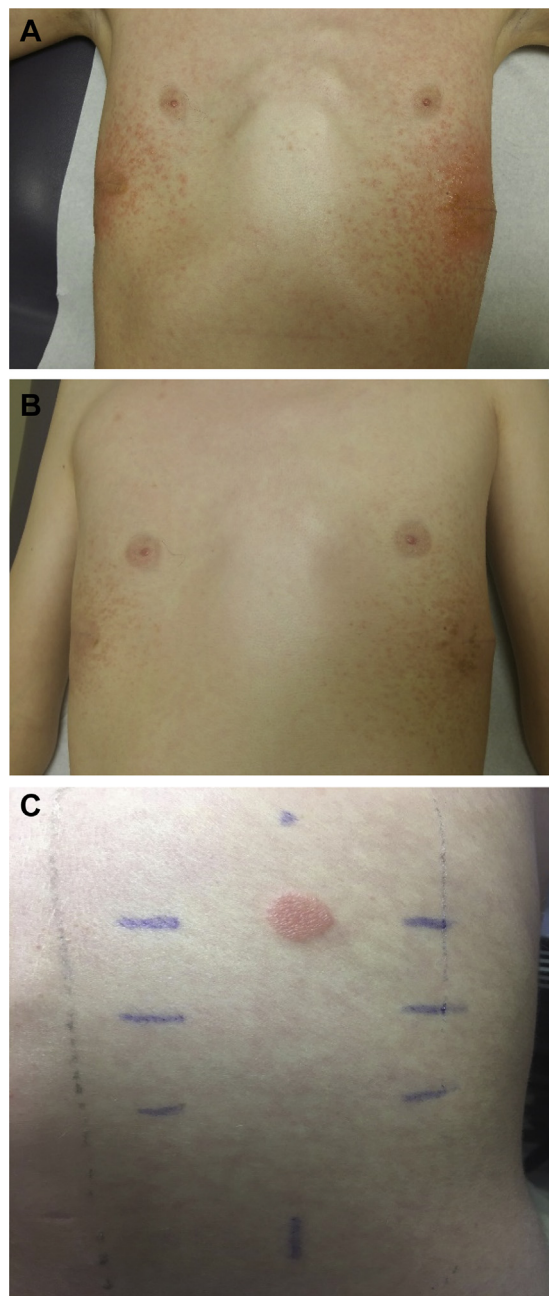


Figure 1. A. Rash around surgical wounds 3 weeks after surgery. B. Improvement of rash after a 5-day course of prednisone treatment. C. Positive skin patch test to 2-octyl cyanoacrylate (Dermabond surgical glue) at 72 hours.

cannot identify the causative ingredient.^{2,4} General sensitivity and specificity of PT for contact hypersensitivity including metal are estimated between 70% and 80%.⁵ The sensitivity and specificity of PT to TA are unknown; however, when PT is strongly positive, as in our case, the patient could be saved from additional tests or unnecessary procedures, including explantation of the metal device. Conversely, when PT is negative in surgery-related CD, the addition of light skin abrading before PT placement may improve diagnostic yield through enhancing allergen penetration.^{2,6} The scraping can be achieved using adhesive tape stripping or a sharp instrument such as a prick test applicator to simulate clinical application for wound closure. Management of TA hypersensitivity includes immediate removal of any remaining adhesive. Patients with CD from TA usually respond to topical corticosteroids,⁷ but oral corticosteroids may be required for severe symptoms.⁴

Metal hypersensitivity can present with eruptions overlying the metal implant and chronic dermatitis occurring weeks to months after surgery. A formation of peri-incisional sterile fistulas may occur.⁸ Positive PT to a metal used in the implant and reactive in vitro LTT to metals can help with the diagnosis. Although PT for metal hypersensitivity has approximately 75% sensitivity,⁹ the sensitivity and specificity of LTT to metal vary greatly between 55% to 95% and 17% to 79%, respectively,¹⁰ and the LTT assays can be expensive. Removal of the offending metal implant is often required for complete recovery.

In summary, our report stresses the importance of delineating TA hypersensitivity from metal implant hypersensitivity, because their managements differ greatly. Before proceeding with removal of metal device in patients who develop peri-incisional, postsurgical rashes suspected to be from metal hypersensitivity, alternative diagnosis including TA hypersensitivity should be considered.

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Vancomycin-induced DRESS syndrome

Drug reaction with eosinophilia and systemic symptoms (DRESS) is a rare but potentially life-threatening drug-induced hypersensitivity reaction. Vancomycin accounts for approximately two thirds of DRESS cases caused by antibiotics.¹ This is important to recognize in light of increasing use of vancomycin; a review of antimicrobial usage in acute care hospitals in the United States reports vancomycin as the most commonly used antimicrobial.² The following case series describes 2 cases of DRESS associated with vancomycin in our institution (Table 1).

A 30-year-old man was transferred to our hospital for evaluation of fever, rash, and lymphadenopathy. He had been diagnosed with mitral valve methicillin-sensitive *Staphylococcus aureus* endocarditis and had completed 6 weeks of cefazolin; however, he had recurrent symptoms 6 months later and was found to have subacute endocarditis, at which time vancomycin was initiated. The patient developed fevers, malaise, and a diffuse rash 1 month after starting vancomycin. Computed tomography of the abdomen showed hepatosplenomegaly with diffuse lymphadenopathy. At this time, he was transferred to our hospital for further management. On presentation to our hospital, he had worsening leukocytosis, worsening renal function, and lactic acidosis. A skin biopsy showed extensive perivascular eosinophilic dermatitis, likely in the setting of drug reaction, at which time DRESS syndrome was suspected and diagnosed with a regiSCAR score,³ which was calculated as 6, indicating definite DRESS. Vancomycin was discontinued;

another antibiotic was not started because he had completed a 4-week course, with repeat blood cultures negative. He was subsequently started on high-dose methylprednisolone, with significant improvement of the rash, and his kidney function returned to baseline. He was discharged on oral steroids with a gradual taper.

Our second patient was a 63-year-old woman with a history of rheumatoid arthritis and hyperlipidemia. She was recently admitted to our hospital with a nonhealing right foot ulcer, found to have osteomyelitis on magnetic resonance imaging of the foot, and



Table 1
RegiSCAR Scoring for DRESS Syndrome³

RegiSCAR group study criteria	No	Yes	Unknown
Fever $\geq 38.5^{\circ}\text{C}$	-1	0	1
Enlarged lymph nodes (≥ 2 sites, >1 cm)	0	1	0
Atypical lymphocytes	0	1	0
Eosinophilia	0		0
700-1,499 or 10%-19.9%		1	
$\geq 1,500$ or $\geq 20\%$		2	
Skin rash	0		0
Extent $>50\%$	0	1	0
At least 2 of: edema, infiltration, purpura, scaling	-1	1	0
Biopsy suggestive of DRESS	-1	0	0
Internal organ involved	0		0
1		1	
≥ 2		2	
Resolution in >15 days	-1	0	1
≥ 3 negative biological investigations to exclude alternative diagnosis	0	1	0

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