

Sabrina Gmuca, MD
Markus D. Boos, MD,
PhD
Amanda Treece, MD
Sona Narula, MD
Lori Billinghamurst, MD,
MSc
Tricia Bhatti, MD
Pablo Laje, MD
Marissa J. Perman, MD
Arastoo Vossough, MD,
PhD
Brian Harding, MA,
DPhil, BM, BCh
Jon Burnham, MD,
MSCE
Brenda Banwell, MD

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DEGOS DISEASE MIMICKING PRIMARY VASCULITIS OF THE CNS

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A 4-year-old boy developed a headache. Initial evaluation revealed a normal neurologic examination and a right subdural hygroma on CT. Worsening headaches led to hospitalization at an outside institution. MRI showed leptomeningeal enhancement; magnetic resonance angiography (MRA) was normal. Infectious, rheumatologic, hematologic, and CSF studies were unrevealing. He then developed a left-sided hemiparesis. Imaging showed increased leptomeningeal enhancement with punctate infarcts in the right hemisphere. CT angiography demonstrated irregularity involving branches of the circle of Willis suggestive of vasculitis. Methylprednisolone ($30 \text{ mg} \cdot \text{kg}^{-1} \cdot \text{d}^{-1} \times 5 \text{ days}$) was administered for presumed CNS vasculitis.

Despite continued glucocorticoid therapy, the patient developed increasing left-sided weakness. Repeat imaging showed perivascular inflammation. Headaches continued and examination revealed left-sided hemiparesis, new-onset right leg weakness, bilateral clonus, and extensor plantar responses. IV cyclophosphamide (dosed every 2 weeks for 4 doses; titrated to $1,000 \text{ mg/m}^2$) was initiated for presumed CNS vasculitis. Rituximab ($750 \text{ mg/m}^2 \times 2 \text{ doses}$) and IV immunoglobulin (2 g/kg divided over 4 days) were added for worsening MRI findings. However, he developed new multifocal infarcts. Infliximab (5 mg/kg) was initiated based on use in resistant CNS vasculitis.¹ Two months after initial diagnosis, the patient was transferred to our institution for a second opinion.

Upon transfer, examination revealed weakness of the left face, arm, and leg; continued right leg weakness; a left homonymous hemianopsia; and bilateral clonus and extensor plantar responses. Spinal and brain MRI revealed multiple spinal cord lesions and acute infarcts in the anterolateral right pons. The patient developed right cranial nerve III palsy. He developed abdominal pain (attributed to neurogenic bladder and constipation). Abdominal and pelvic MRA and serologies did not demonstrate systemic vasculitis.

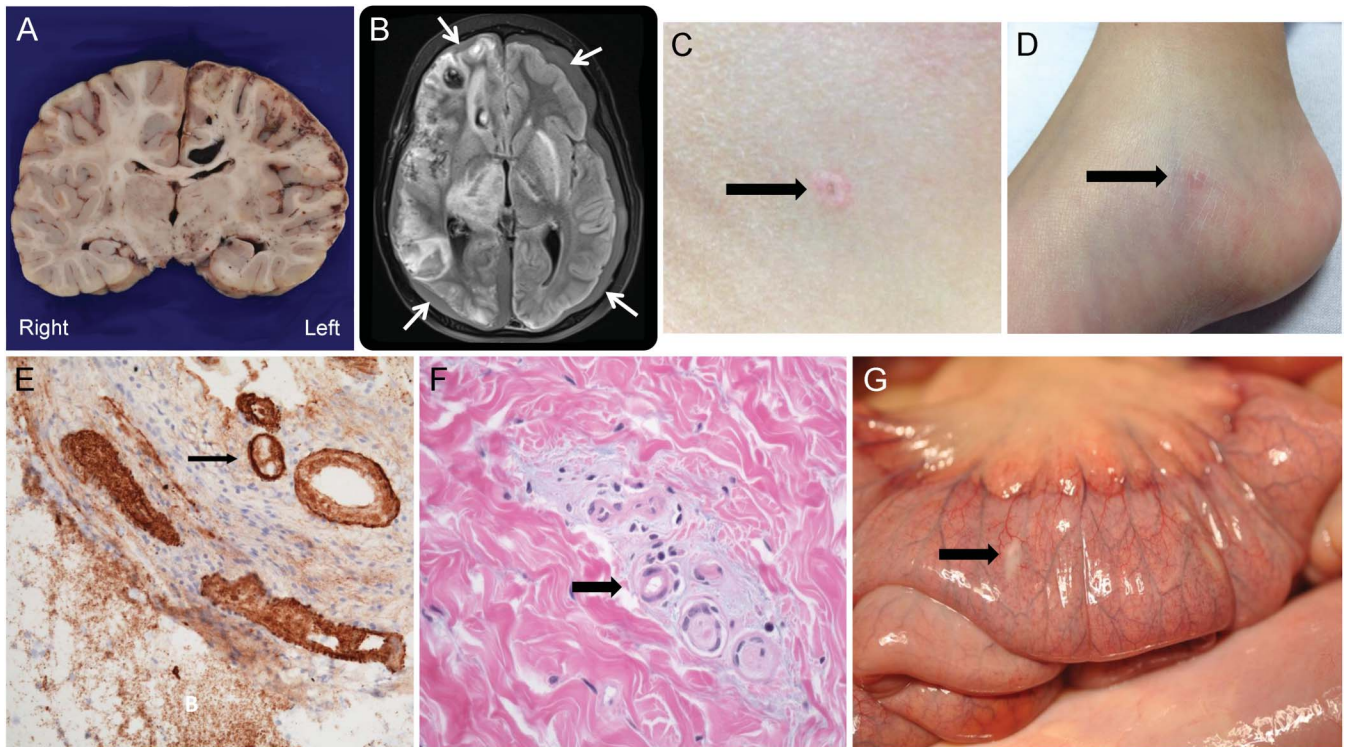
Based on his subdural fluid collections, abdominal pain, and the refractory nature of his vascular process, Degos disease was proposed as a unifying diagnosis.² Previously rash-free, the patient was now noted to

have a 4-mm porcelain white abdominal papule with central atrophy and an erythematous rim (figure, C). A papule with a dull pink-gray center and red telangiectatic rim was present on his right foot (figure, D). Skin biopsy revealed central epidermal atrophy with hyperkeratosis and increased dermal mucin and fibrin thrombi (figure, F). Small dermal vessels demonstrated degeneration of their walls, leading to a smudged appearance (figure, F). Eculizumab³ and treprostinil⁴ were initiated for presumed Degos.

The patient developed worsening abdominal pain. He was found to have 3 gastric perforations, which were repaired. He developed right upper extremity myoclonic movements necessitating intubation for sedation. MRI demonstrated worsened right-sided and new left hemispheric leptomeningeal enhancement, as well as a new subacute right thalamic infarct extending to the brainstem (figure, B). Anti-VLA4 therapy (natalizumab; 5 mg/kg) was added to reduce CD4 T-cell access into the CNS. MRI 1 week later revealed increasing bilateral hemispheric disease and progression of the deep gray nuclei and brainstem lesions. Palliative care was provided; the patient died of respiratory failure after elective extubation.

Autopsy findings. Multiple skin lesions were histologically similar to the initial skin biopsy. Scattered porcelain plaques were identified on the serosal surface of the small bowel corresponding to areas of mucin deposition in the serosa and thrombosis of small to medium-sized vessels on histology (figure, G). There was evidence of impending distal small bowel perforation. The areas of prior repair in the stomach showed thrombosis of small to medium-sized vessels with necrosis. Neuropathology (brain and spinal cord) revealed extensive CNS vasculopathy, with multiple foci of hemorrhage and infarction (figure, F). There were fibrin plugs in capillaries, venules, and arterioles in both the CNS parenchyma and leptomeninges. Deposition of membrane attack complex (C5b-9) was demonstrated in the cortical vessel walls (figure, E).

Discussion. Degos disease (malignant atrophic papulosis) is a rare multiorgan thrombo-obliterative disorder. With systemic disease, median survival time is approximately 2 years, with a 3-year survival



(A) Coronal section of the brain. In the right hemisphere, there are multiple hemorrhages in white matter, hippocampus, basal gray matter, and extensive hemorrhagic cortical infarction. (B) MRI fluid-attenuated inversion recovery image shows bilateral subdural collections (arrows) with extensive subacute infarcts and hemorrhage, predominantly on the right. (C) A 4-mm porcelain white papule with central atrophy and an erythematous rim on the patient's left abdomen. (D) Papule with a dull pink gray center and red rim present on the right medial plantar foot. (E) Deposition of membrane attack complex C5b-9 in vessel walls, immunoperoxidase $\times 10$. (F) High-power view of the skin shows increased mucin (arrow) around dermal vessels. The vessel walls have a smudged appearance and 2 are filled with fibrin thrombi. (G) White porcelain lesions (arrow) on the proximal bowel serosa seen at autopsy. Microscopically, these areas show increased mucin, abnormal vessels with degenerating, smudged vessel walls, and thrombi in medium-sized vessels.

rate of less than 50%.^{5,6} Pathognomonic skin lesions facilitate a diagnosis. These small (0.5–1 cm) skin lesions are usually located on the trunk and extremities and exhibit central porcelain white atrophy with a surrounding telangiectatic rim.⁷ There are fewer than 200 cases of Degos reported in the literature, and it is exceedingly uncommon in children.⁷

This case demonstrates the challenges of diagnosing and treating rare inflammatory CNS vasculopathies in children. As in our case, Degos disease may present with isolated neurologic manifestations prior to the development of its cutaneous and gastrointestinal manifestations. The presence of subtle yet unique skin lesions in combination with neurologic complications, including subdural fluid collections, provide critical clues to the diagnosis of this rare disease.

From Children's Hospital of Philadelphia (S.G., A.T., S.N., L.B., T.B., P.L., M.J.P., A.V., B.H., J.B., B.B.), PA; and Seattle Children's Hospital (M.D.B.), WA

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aspects of the case. Drs. Treece and Harding revised the manuscript and drafted the information relevant to the pathologic findings and also contributed images for the manuscript. Drs. Perman, Laje, Burnham, Narula, and Billingham edited and revised the final manuscript. Dr. Vossough corrected and added information with regards to the radiology findings and contributed images to the manuscript. Dr. Banwell made multiple revisions to the work from the drafting stages through the final revisions of the manuscript and provided intellectual oversight.

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Correspondence to Dr. Gmuca: gmucas@email.chop.edu

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