

## Postponed depth electrode placement due to seborrheic dermatitis of the scalp: illustrative case

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**BACKGROUND** Seborrheic dermatitis is a common fungal infection of the scalp that may potentially affect depth electrode placement for intracranial seizure monitoring. No cases documenting the safety of proceeding with depth electrode placement in the setting of seborrheic dermatitis have been reported.

**OBSERVATIONS** A 19-year-old man with a history of drug-resistant epilepsy was taken to the operating room for placement of depth electrodes for long-term seizure monitoring. Annular patches of erythema with trailing scales were discovered after shaving the patient's head. Dermatology service was consulted, and surgery was cancelled because of the uncertainty of his diagnosis and possible intracranial spreading. He was diagnosed with severe seborrheic dermatitis and treated with topical ketoconazole. Surgery was rescheduled, and the patient received successful placement and removal of depth electrodes without any complications.

**LESSONS** Seborrheic dermatitis is a common skin infection that, in the authors' experience, is unlikely to lead to any intracranial spread after treatment. However, surgeons should use clinical judgment and engage dermatology colleagues regarding any uncertain skin lesions.

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**KEYWORDS** seborrheic dermatitis; neurosurgery; scalp; depth electrode

Same-day cancellations affect all involved parties, including surgeons, anesthesiologists, scrub nurses, the patient, and the patient's family. These cancellations lead to a waste of resources and inefficient use of operating room (OR) time. Additionally, same-day cancellations may lead to unnecessary stress and be costly to the patient as a result of taking off work.<sup>1</sup> The suspected incidence of same-day cancellations ranges from 10% to 40%, with the most common reason being lack of OR time.<sup>1,2</sup> Infections are a rare cause of same-day cancellations, and seborrheic dermatitis being a reason for surgery cancellation has not yet been reported.<sup>2</sup>

Epilepsy is one of the most common neurological diseases, with a lifetime prevalence of 7.60 per 1,000 persons.<sup>3</sup> Appropriately selected patients with drug-resistant epilepsy may receive depth electrode placement for seizure focus localization. There is a 1.3% overall complication rate for depth electrodes, with the prevalence of infection being 0.8%.<sup>4</sup> Depth electrodes typically remain implanted during long-term intracranial video monitoring for a period of 1 to 2 weeks or longer, posing as a potential nidus for infection.

Common infectious scalp conditions include tinea capitis and seborrheic dermatitis. The classic difference between these two diseases is that tinea capitis tends to cause lymphadenopathy and alopecia and has a predilection for African Americans whereas seborrheic dermatitis affects all people and does not typically lead to lymphadenopathy or alopecia.<sup>5</sup> Prior cutaneous tinea pedis has been described as leading to superimposed bacterial cellulitis of the feet.<sup>5</sup> However, it is unknown if these dermatologic conditions, when present on the scalp with a pathway into the skull, would spread intracranially.

No literature is available on placing depth electrodes in the setting of superficial skin infections. We report a case of severe seborrheic dermatitis of the scalp leading to same-day cancellation of depth electrode placement with successful surgery after treatment.

### Illustrative Case

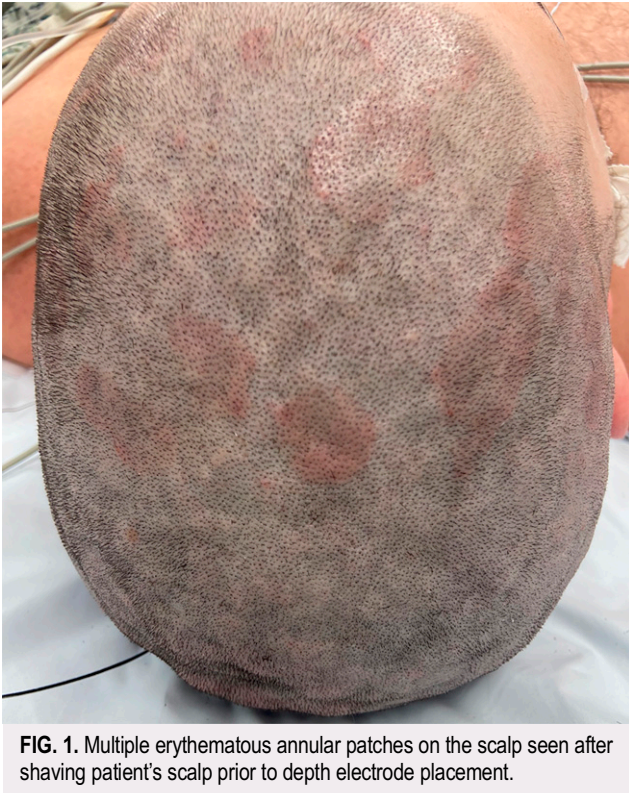
Our patient is a 19-year-old man with drug-resistant epilepsy and no known prior medical history of skin rash who was scheduled

**ABBREVIATION** OR = operating room.

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**FIG. 1.** Multiple erythematous annular patches on the scalp seen after shaving patient's scalp prior to depth electrode placement.

for depth electrode placement for seizure focus localization. After shaving the patient's head in the OR, annular patches of erythema with trailing scale were noted throughout his scalp (Fig. 1). Dermatology service was consulted in the OR. Based on clinical findings, the differential included psoriasis, tinea capitis, seborrheic dermatitis, and cutaneous discoid lupus. A potassium hydroxide skin scraping was performed and tentatively tested positive for tinea capitis. Because of the uncertainty of the diagnosis and possible implication of superficial infection spreading intracranially, the surgery was cancelled.

The patient was seen the same day in the outpatient dermatology clinic, where he gave a history that he was unaware of the rash, had not noticed it prior to his surgery, and did not note any symptoms such as pruritis, tenderness, or scaling. A punch biopsy and culture were collected from the frontal scalp, where the lesions were most severe. Biopsy demonstrated severe seborrheic dermatitis, and fungal cultures were negative, ruling out a concomitant tinea capitis infection. The patient was treated with topical ketoconazole 2% cream applied twice daily to control the seborrheic dermatitis.

A dermatologist found the seborrheic dermatitis well controlled with ketoconazole shampoo and cleared the patient for surgery. He received depth electrode placement 4 days after the canceled surgery with no changes in surgical management given the noninfectious nature of seborrheic dermatitis. After phase II intracranial monitoring was completed, electrode removal took place 8 days later and the patient was discharged home without any complications. At 3 weeks, the patient was healing well with no concerns for infection.

## Discussion

### Observations

In our case, we initially canceled depth electrode placement because of multiple lesions seen on the scalp that were potentially

due to a fungal infection. Given the uncertainty of the diagnosis, it was considered not safe to proceed until scalp biopsy results were obtained. The biopsy ultimately demonstrated severe seborrheic dermatitis. To our knowledge, there are no reported cases of depth electrode placement in the setting of dermatologic conditions. Furthermore, no guidelines exist on the management of flaring seborrheic dermatitis when pursuing cranial surgery.

Depth electrode placement for long-term seizure monitoring is a minimally invasive procedure with generally low risk of complications.<sup>4</sup> These surgeries often require patients to spend weeks in the epilepsy monitoring unit. The depth electrodes are placed intracranially into brain parenchyma through bolts that are screwed into small burr holes drilled into the skull. The ends of the electrodes extracranially are connected to equipment to allow for monitoring of brain activity. The concern for seeding an intracranial infection is valid in the setting of a dermatologic abnormality.

Seborrheic dermatitis is a common skin condition that affects ~1% to 3% of the population.<sup>6</sup> It is a chronic inflammatory response to *Malassezia* yeast and characteristically causes white-to-yellow greasy scaling, pruritis, and erythema on affected areas.<sup>6</sup> These areas include body surfaces with a high density of sebaceous glands, such as the scalp, axilla, chest, and groin. Treatment is lifelong and typically includes topical formulas such as medicated shampoos, antifungals, or corticosteroids.<sup>6</sup> Although seborrheic dermatitis itself may not be an indication for delaying surgery, it is often associated with other skin bacteria, including *Staphylococcus* and *Propionibacterium* species, which can lead to deep infections.<sup>7</sup>

## Lessons

In conclusion, if seborrheic dermatitis is suspected, we recommend postponing cranial surgery while pursuing treatment for the skin condition by consulting dermatology services. Our report is limited because it involves a single patient case report and the patient was seen at an academic medical center with access to dermatology services. To prevent same-day surgery cancellation, it may be helpful to perform a thorough scalp check to identify any erythematous or greasy scales.

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## Disclosures

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.

**Author Contributions**

Conception and design: Minchew. Acquisition of data: Minchew, Ferguson, Guillotte. Analysis and interpretation of data: Minchew, Guillotte. Drafting the article: Minchew, Ferguson. Critically revising the article: all authors. Reviewed submitted version of manuscript: Minchew, Ferguson, Guillotte. Approved the final version of the manuscript on behalf of all authors: Minchew.

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