Red Light PDT for Prevention of Basal Cell Carcinomas in Basal Cell Nevus Syndrome Individuals

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Although there are many options for treating BCCs in patients with Gorlin syndrome, Mohs micrographic surgery (MMS) remains the gold standard. Dr. Armand B. Cognetta, Jr., is a dermatologist and founder of Dermatology Associates of Tallahassee. Dr. Cognetta has been involved with leading researchers on Gorlin syndrome and explored ways to prevent BCCs in Gorlin syndrome patients. Utilizing his years of experience in treating high-risk skin cancer patients and knowledge of skin cancer detection and management, he has published two case studies using topical red-light therapy, known as methyl aminolaevulinate photodynamic therapy (MAL-PDT) aka red-light PDT, and documented how it affected the number of BCCs the patient developed.

The process of MAL-PDT involves application of a gel to the face, with an incubation period of 3 hours while the patient waits in the clinic, followed by administration of red light for 10 minutes. Because red light has a longer wavelength than blue light therapy, it penetrates the skin in a deeper fashion. Dr. Cognetta first started a prophylactic regimen of MAL-PDT on one patient with Gorlin syndrome in 2011. Prior to this, she had had a total of 20 prior midline facial BCCs develop over the span of 20 years. Soon after implementation, Dr. Cognetta noticed a decrease in the number of facial BCCs the patient developed over time. The patient continued this annual regimen of MAL-PDT for a decade with the goal of prevention of future skin cancers. It should be noted that red-light PDT is widely used in Europe for treatment of BCCs including facial BCCs and is used in Gorlin syndrome patients. It is not indicated or approved for use in the U.S. for BCCs but is approved for precancers here.

With annual MAL-PDT/red-light PDT, the patient developed only three facial BCCs within the first four years of treatment. Over the next eight years, she developed no facial BCCs (Figure 1) and achieved excellent cosmetic results (Figure 2). The 3 BCCs that developed early on in her treatment course (and none late in treatment course) suggests MAL-PDT may decrease the incidence of BCCs in a cumulative manner. Dr. Cognetta believes MAL-PDT may be an effective prophylactic tool for Gorlin syndrome patients and also patients with multiple midline facial BCCs. The use of red-light PDT for Gorlin syndrome needs further study. Based on its widespread use in Europe for BCCs and a European Consensus Committee paper that discussed its use in Gorlin syndrome, this may become an option to reduce BCCs in this population.

Dr. Cognetta is the founder of Dermatology Associates of Tallahassee, a group of fourteen dermatologists in the Florida Panhandle and south Georgia, and a noted expert on skin cancer detection and treatment. He is the Chief of the Division of Dermatology for the Florida State University College of Medicine. He is a fellowship director at the American College of Mohs Microscopic Surgery and Cutaneous Oncology and has trained over twenty Mohs surgeons throughout the United States.

Figure 1. Facial scattergram demonstrating the number of BCCs developed in the patient before and after starting MAL-PDT.

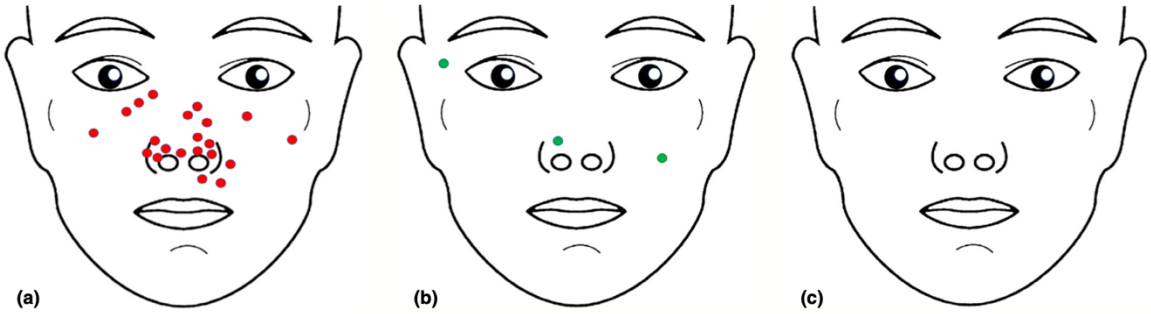

FIGURE 1 Basal cell carcinoma (BCC) facial scattergram displaying: (a) ( ) BCCs developed between 1982–2011. From 2002–2008, chemopreventive modalities were utilized (celecoxib, topical imiquimod) with varying success. (b) ( ) BCCs developed between 2012–2015 with annual MAL-PDT treatment. (c) No BCCs developed between 2016–2022 with continued annual MAL-PDT treatment.

Figure 2. Cosmetic results of MAL-PDT.

FIGURE 2 Cosmetic results 6 years after initiating an annual red light MAL-PDT treatment regimen

Quote from the patient below:

"*I absolutely love MAL-PDT and can't recommend it enough. I have no complaints about the procedure, although it may be a bit uncomfortable in the first 24 hours of application. I have a higher pain tolerance, and I only take Tylenol if needed within that first day of treatment for the pain. When I first started MAL-PDT, I experienced some peeling of the skin within the first 48-72 hours, but this has reduced greatly over time. The peeling lasts no longer than 3 days for me.*

I think all patients with Gorlin syndrome should consider this treatment. Dr. Cognetta has me on a yearly treatment regimen of one session of MAL-PDT once a week for two weeks straight. MAL-PDT has drastically cut down the number of Mohs surgeries I have undergone. I've had more than 54 Mohs surgeries in my lifetime, and I can't remember the last time I had a surgery on my face. I truly believe in MAL-PDT, and I wish I started it a lot sooner!"

Published papers:

1. Thompson, A., Mattia, A., Green, W. H., & Cognetta, A. B. (2022). A 10-year follow-up on the chemopreventive role of photodynamic therapy in a Gorlin syndrome patient. *The Australasian Journal of Dermatology*, *63*(4), e378–e379.

   Link: https://pubmed.ncbi.nlm.nih.gov/36222440/

2. Wolfe, C. M., Green, W. H., Cognetta, A. B., & Hatfield, H. K. (2013). A possible chemopreventive role for photodynamic therapy in Gorlin syndrome: a report of basal cell carcinoma reduction and review of literature. *The Australasian Journal of Dermatology*, *54*(1), 64–68.

   Link: https://pubmed.ncbi.nlm.nih.gov/22780558/

3. European Consensus Committee Paper: https://onlinelibrary.wiley.com/doi/10.1111/jdv.12150