



## Successful one step CO<sub>2</sub> laser ablation of BCC in gorlin syndrome

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### Abstract

Carbon dioxide laser is a promising treatment option of multiple dermo-epidermal lesions in outpatient environment. Multiple and superficial basal carcinomas in Gorlin syndrome may be successfully treated in one step, with high therapeutic speed. We discuss two cases of successful laser treatment of multiple BCC in patients with Gorlin syndrome. Total of 14 lesions in a male patient, and 9 lesions in a female patient, respectively were treated with CO<sub>2</sub> laser ablation in one-step treatment session. Achieved excellent aesthetic results are undoubtedly, an important factor for patient's adequate self-esteem, as even hairs on his head are preserved. We discuss few advantages of using a CO<sub>2</sub> ablative destruction of BCC in Gorlin: no need for antiseptics as the laser sterilizes the treatment area, no postoperative pain, a bloodless operating field, very good therapeutic and cosmetic results, fast epithelialization with minimal risks of complications. A possible BCC recurrence is easy detectable, and can be eliminated within the follow-up frames.

**Keywords:** gorlin syndrome, nevoid basal cell carcinoma, CO<sub>2</sub> laser ablation, multiple basal cell carcinoma, multiple BCC

### Introduction

Gorlin syndrome (Nevoid Basal Cell Carcinoma) is a rare hereditary autosomal disorder, characterised by early onset basal cell carcinoma, multiple odontogenic keratocysts, skeletal abnormalities and can cause unusual facial appearances. Medulloblastoma, congenital malformations, eye (cataract, coloboma, etc) and other anomalies can be present. As a multisystemic disease, it affects many organ systems, although all features of this syndrome are rarely observed in one patient [7]. Gorlin syndrome appears to have complete penetrance and variable expressivity, it is characterized mainly with a multiple BCC presence, and choice of treatment depends on tumor type, size, location, and depth of penetration, patient's age and health condition, and the likely result to patient's appearance [1]. Recently, a new option of treatment of BCC is described in scientific literature. It provides data on effectiveness of Curaderm BEC5, a topical cream, that contains BEC glycoalkaloids 0.005%, in treating skin cancers, as Solamargine, also kills cancer cells by oncosis, as marked changes in cell shape and volume occur [2]. Review of literature provides data that Solamargine, at low doses kills cancer cell by apoptosis, and by oncosis in high doses, as intermediate concentrations of Solamargine induce both ways of cell death [8, 9]. Another promising treatment option for multiple and superficial basal carcinomas in Gorlin syndrome is carbon dioxide laser. Laser ablation modality would be most beneficial for patients with multiple superficial basal cell carcinomas [4]. In my opinion, treatment with carbon dioxide laser offers significant advantages, such as: a bloodless operating field; a high therapeutic speed which allows a huge number of lesions to be treated in one session; no need for antiseptics and/or disinfectants as the laser sterilizes treatment area; no postoperative pain experienced since the laser coagulates the blood vessels, and seals nerve endings; no rough scarring; very good aesthetic results, and possible recurrence and any new lesions are easy detectable, and can be eliminated within the

follow-up frames. Presented are two cases of successful treatment of multiple BCC in patients with Gorlin syndrome, treated with CO<sub>2</sub> laser ablation in a one-step treatment session. Achieved excellent aesthetic results with no rough scarring, and hairs on the head of the male patient remain preserved.

### Materials and Methods of Treatment

Case study 1 presents treatment of a 32-year-old male patient, with Fitzpatrick skintype 3, Gorlin syndrome and multiple BCC on his head, and trunk. The very first lesion manifested at his 27 years of age on his left shoulder, and has been surgically removed within a wide range. A huge postoperative cicatrix, unaesthetically relaxed in extension area is shown on Fig 1. Histology examination of the excised lesion demonstrated typical BCC characteristics. Upon the onset of the second lesion near to the first one, the patient was looking for other treatment alternatives. Meanwhile, he did undergo (52Gy, 13 sessions) X-ray therapy in an oncology clinic. X-ray therapy results presented with an unaesthetic, atrophic, and hypopigmented scar with hyperpigmented patches and teleangiectatic vessels at the ends (Fig 1). Being extremely dissatisfied with the cosmetic outcome of the guideline's surgical procedure and the X-ray therapy the patient reported, he kept looking for other treatment alternatives. He admitted that he has discovered on-line a new treatment option with Solasodine (Curaderm BEC5), and began treating all newly appeared lesions on his head with this topical remedy. A therapeutic response was observed, yet lesions responded slowly to treatment, and became impetiginized. The patient presented for a medical examination in our clinic with impetiginized and residual BCC lesions. The medical check-up revealed 14 superficial BCC on his head and trunk, (Fig.2, photos on the left). One of the lesions on his back was punch biopsied. Histological examination confirmed diagnosis of BCC. Multiple lesions and their early onset suggested Gorlin syndrome. The patient recalls,

an odontogenic cyst was surgically removed in his adolescence years. He did admit his passion for sun bathing as in his words "...I am there where the sun is..." He reported, he has repeatedly visited the emblematic Caribbean, Bahamas, Singapore, and Canary Islands beaches. His solar skin damage is very evident, with plenty of pigmented spots, and solar lentigenes on his trunk. All 14 lesions were treated in one session, and a lesion located on the capillicium was later revised (re-treated) within the 2-months obligatory post treatment follow-up. Ablated at the same time were also lentigenes, as facultative precanceroses for easy detection of any newly emerged lesions (Fig. 2, photos on the right side). All 14 lesions were CO<sub>2</sub> laser ablated with power density of 500-800W/cm<sup>2</sup>. The patient was informed about the need of timely removal of newly appeared lesions and regular follow-ups since in Gorlin syndrom the presence of new lesions is highly expected. Elimination of newly appeared lesions is easy when they are still small in size, and provided that patient is properly informed.

The second described successful treatment of BCC in Gorlin presents a 62 years old female patient with 9 superficial BCC lesions. This patient first appeared in our outpatient practice in 2014. She was then 57 years of age. During the medical examination performed in 2014 total of 9 basal cell carcinoma with a clinical picture of Gorlyn syndrome were found - 4 lesions on her back, 1 under her left breast, 1 on the right axilla, 2 on the left lower eyelid, and 1 on her right upper eyelid (Fig. 3, left side photos). Lesions are superficial and relatively slow growing. The one on the upper eyelid (that has appeared first ) was the most advanced. The patient reported that she was offered an operative intervention on the upper right eyelid, in an oncology clinic. However, after the expected cosmetic defect was explained to her, she refused undergoing surgery. We offered her a treatment with CO<sub>2</sub> laser ablation on which she agreed. All 9 lesions were CO<sub>2</sub> laser ablated with power density of 500-800W/cm<sup>2</sup> (Fig.3, right side photos). After the successful laser therapy the patient is being kept under review, and strict follow-ups for 5 years. During this whole period, a recurrence on her right eyelid occurred, and was eliminated with laser ablation. The patient is thoroughly informed on using a strict photo-protection, and about a high probability of new lesion appearance, and when it happens, she is instructed to present without hesitation for removal of the new lesion.

### Results and Discussion

Scientific literature reports about successful treatment of superficial and nodular BCC using CO<sub>2</sub> laser ablation [3]; that laser ablation modality would be most beneficial for patients with multiple superficial basal cell carcinomas [4]. It could be an alternative treatment for BCC when other treatments are not possible or available [6]. Even though surgical excision remains the treatment of choice for basal cell carcinoma, CO<sub>2</sub> vaporization offers many advantages in treatment of BCC [5].

In my opinion, carbon dioxide laser ablation is a promising treatment option for multiple and superficial basal carcinomas in Gorlin syndrome, as they can be successfully treated in one step, applying a high therapeutic speed which allows a huge number of lesions to be eliminated in one session. In past, I have been treating other BCC cases with this method. Based on my clinical experience for about 30 years in laser dermatology I argue that CO<sub>2</sub> laser ablation is appropriate for treatment of BCC in Gorlin for it is therapeutically effective and rapid, and treatment can be performed on an outpatient basis. Its effectiveness is demonstrated in both cases presented, as well as in treatment of single basiliomas, when for some reason, patients refuse surgery. It is important to add, that patients are kept under strict supervision, and informed about the necessity of timely removal of any newly appeared lesions.

It is opinion that CO<sub>2</sub> ablation is a very good alternative to surgical elimination of non-melanoma multiple skin cancers. In addition, the aesthetic result can further be refined by a subsequently performed fractional laser procedure. My opinion is, treatment of BCC with CO<sub>2</sub> laser characterizes with very precise and constricted tissue damage, and offers advantages, such as: a bloodless operating field; no need for antiseptics and/or disinfectants as the laser sterilizes treatment area; no postoperative pain experienced since the laser coagulates the blood vessels, and seals nerve endings; no rough scarring; very good aesthetic results, considering that even hair follicles can be preserved; treatment is easy to repeat if necessary - a possible recurrence and any new lesions are easy detectable, and can be eliminated within the follow-up frames.

### Conclusions

Results demonstrate that CO<sub>2</sub> laser ablation is a promising treatment option for removal of large, multiple and superficial basal carcinomas in Gorlin syndrome, as they can be successfully treated in one step, applying a high therapeutic speed, with precise and restricted tissue damage, with highly aesthetic results to patient appearance, and hence to patient overall self-esteem, and well-being, respectively.



**Fig 1:** Two unaesthetic scars from surgical excision and X-ray therapy on patient's left shoulder.



**Fig 2:** Several BCC on hairy section of his head and trunk, previously treated by the patient himself with Curaderm BEC5 (Solasonine), and same body areas, after one step CO<sub>2</sub> laser ablation, six months post treatment. A delicate scar on his head with minimal hair loss is observed.



**Fig 3:** Some of multiple BCC in 62 years old patient, all treated with one-step laser ablation, before and after.

## References

1. Agrawal SN, Daware PP, Deshmukh YR, Jane S. Gorlin's syndrome: Atypical case report. *Our Dermatol Online*. 2014; 5(4):378-380. DOI: 10.7241/ourd.20144.94
2. Cham B. Intralesion and Curaderm BEC5 Topical Combination Therapies of Solasodine Rhamnosyl Glycosides Derived from the Eggplant or Devil's Apple Result in Rapid Removal of Large Skin Cancers. *Methods of Treatment Compared*. *Int. Journal of Clinical Medicine*, 2012; 3:115-124. <http://dx.doi.org/10.4236/ijcm.2012.32024>
3. Hibler BP, Sierra H, Cordova M, Phillips W, Rajadhyaksha M, Nehal KS, *et al*. Carbon Dioxide Laser Ablation of Basal Cell Carcinoma with Visual Guidance by Reflectance Confocal Microscopy: A Proof of Principle Pilot Study. *Br. J Dermatol*. 2016; 174(6):1359-1364. DOI: 10.1111/bjd.144414
4. Horlock N, Grobbelaar AO, Gault DT. Can the carbon dioxide laser completely ablate basal cell carcinomas? A histological study. *British Journal of Plastic Surgery*. 2000; 53:286-293. DOI: 10.1054/bjps.1999.3277
5. Jesús del Pozo, Laura Rosende. *Advances in Cancer Research & Treatment*, 2013. DOI: 10.5171/2013.442049
6. Kavoussi H, Ebrahimi A. Treatment and cosmetic outcome of superpulsed CO<sub>2</sub> laser for basal cell carcinoma. *Acta dermatovenerologica Alpina, Panonica, et Adriatica*, Sept. 2013; 22(3):57-61. DOI: 10.2478/v10162-012-0035-y
7. Ramesh M, Krishnan R, Chalakkal P, Paul G. Gorlin- Goltz syndrome: Case report and literature review. *J Oral Maxillofac Pathol*, 2015, 19:267. DOI: 10.4103/0973-029X.164557
8. Sun LM, Zhao Y, Li X, Yuan HQ, Cheng AX, Lou HX, *et al*. A Lysosomal-Mitochondrial Death Path-way Is Induced by Solamargine in Human K562 Leukemia Cells. *Toxicology in Vitro*, 2010; 24:1504-1511. <http://dx.doi.org/10.1016/j.tiv.2010.07.013>
9. Sun LM, Zhao Y, Yuan HQ, Li X, Cheng AX, Lou HX. Solamargine, a Steroidal Alkaloid Glycoside, Induces Oncosis in Human K562 Leukemia and Squamous Cell Carcinoma KB Cells. *Cancer Chemotherapy and Pharmacology*. 2011; 67(4):813-21. doi: 10.1007/s00280-010-1387-9

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