

CO₂ Laser Resection of Giant Rhinophyma Under Local Anesthesia: A Case Report

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Introduction and Importance: Phymatous rosacea (PhR), also known as “rhinophyma”, refers to a benign condition characterized by the excessive proliferation of sebaceous glands and fibrosis in the facial skin due to rosacea, leading to thickening and hardening of the nasal skin, ultimately developing into rhinophyma. This disease’s pathophysiology remains unclear but is seen as an advanced stage of rosacea.

Presentation of Case: The patient is a 67-year-old male and has hypertrophy of nasal tip and an enlarged nodule measuring approximately 7 cm × 6.1 cm × 4.5 cm in size of dark red color, uneven surface, clear dilation of follicular orifices, presence of white pustules and yellowish-white comedone-like secretions on light touch. Compression causes deformity of the nostrils that influences the quality of life and breathing. A total excision of the rhinophyma under local anesthesia by means of the CO₂ laser surgery was agreed upon. The dressing changes were used to treat the wound after surgery and full healing took place after 30 days. The patient had satisfactory results, both in a functional and aesthetic sense, with the result having no recurrence in 1 year after surgery.

Clinical Discussion: The CO₂ laser therapy with local anesthesia is an extension of traditional general anesthesia surgery when it comes to the removal of rhinophyma because it is easy to perform the surgery, with minimal trauma, bleeding, and no follow-up surgical operation, which leads to the development of a personal approach to the treatment. In our case, reconstructing the nasal area is complicated by the decision on anesthesia and management of nasal wound, which does not interfere with its functionality and beauty.

Conclusion: In this report, we emphasize the surgical value of local anesthesia with CO₂ laser for rhinophyma, reducing blood loss, operation time, and the need for secondary surgery. Follow-up for 1 year.

Plain Language Summary: ① We report a case of giant rhinophyma treatment, supplementing clinical data for this type of disease; ② We propose performing the surgery under local anesthesia, which shortens the operation time and hospitalization time compared to traditional general anesthesia; ③ The clinical practicality of CO₂ laser in the treatment of rhinophyma is provided as a reference.

Keywords: rosacea, rhinophyma, local anesthesia, CO₂ laser

Introduction

PhR, also known as “rhinophyma”, refers to a disease caused by the excessive proliferation of sebaceous glands and fibrosis in the face due to rosacea, leading to thickening and hardening of the nasal skin, developing into rhinophyma. From a histopathological perspective, rhinovegetation is characterized by hypertrophic sebaceous glands, a fibrovascular mucinous matrix, and dermal lymphocyte infiltration.¹ In advanced cases, fibrosis may destroy sebaceous glands,² though the exact etiology and pathogenesis remain unclear.³ Rhinophyma is more common in elderly males⁴ and is one of the most severe manifestations of rosacea. The large mass of rhinophyma can cause collapse of the external nasal valve, affecting the patient’s normal breathing and eating, reducing the patient’s quality of life,⁵ and having a significant negative impact on mental health, especially in social aspects.^{6,7} Early-stage rosacea can be treated with CO₂ fractional laser, while surgical treatment is the preferred method for rhinophyma once the condition progresses.^{7,8} Depending on the state of the patient and the dimensions of the rhinophyma, the selection of a method to be applied surgically can be fully understandable, and some of the most frequently used procedures, such as excision, ablation, laser techniques, and their

Table 1 The Duration of Disease Progression, Any Previous Treatments, Relevant Comorbidities

Timepoint	Key Events	Diagnosis/Treatment
12 years prior to presentation (around July 2012)	A localized persistent erythema appeared on the nose, accompanied by telangiectasia; recurrent pustules formed and resolved after rupture; skin thickened and follicular openings enlarged after each resolution; symptoms fluctuated in severity.	The patient visited a local hospital and was diagnosed with rosacea, but did not receive regular treatment.
5 years prior to presentation (around July 2019)	The nasal tip began to gradually enlarge, with no associated pain.	The patient did not receive any medical intervention.
1 year prior to presentation (July 2023 – June 2024)	The nasal mass enlarged rapidly, causing difficulty breathing and eating, and hindering normal social interactions.	The patient did not seek timely medical attention; symptoms continued to worsen.
July 1, 2024	The patient presented to our hospital with the above symptoms; physical examination revealed a giant nasal mass (7 cm × 6.1 cm × 4.5 cm) with corresponding findings.	Outpatient evaluation confirmed the diagnosis of phymatous PhR, and a surgical treatment plan was formulated.

combinations, may be used.⁶ In this case, we provide an account of a successful surgical procedure that utilizes local anesthesia to excise the rhinophyma of a 67-year-old male patient, since the rhinophyma was penetrating into the patient’s breathing, eating, and social interactions. It is an article that includes a case (written following the Surgical Case Report (SCARE) guidelines).

Patient Information

The patient, a 67-year-old male, reported having a rhinophyma as a result of rosacea over the past 12 years. According to the patient, 12 years ago, The patient had a history of hypertension. He had continuous localized redness in the nasal region with telangiectasia, followed by a pustule, which could resolve after self-extraction. The skin became thickened with increased follicular orifices, to varying degrees after subsiding. He had already visited a local hospital, where he was diagnosed with rosacea but was not treated regularly. Five years ago, the nasal tip began to grow slowly outward without pain and was not treated. In the past year, the nasal growth enlarged to affect breathing, eating, and normal social interactions, leading to a clinic visit on July 1, 2024, with an outpatient diagnosis of “PhR” (See Table 1).

Clinical Findings

Nasal tip growth, measuring approximately 7 cm × 6.1 cm × 4.5 cm, with a dark red color, uneven surface, obvious dilation of follicular orifices, visible white pustules, and yellowish-white comedone-like secretions upon light touch. The nostrils are deformed due to compression, but the patient did not experience pain. Based on these prior findings, the patient had to undergo surgical excision of the mass (See Figure 1).



Figure 1 (A) Preoperative anteroposterior view; (B) Preoperative left lateral view; (C) Preoperative right lateral view.

Diagnostic Assessment

Diagnosis: Medical history and clinical presentation: Giant nasal tip growth, compressed and deformed nasal apertures, thickened nasal skin, uneven surface, extremely dilated sebaceous gland openings, excessive secretion, shiny oily surface, dark red color, gradually formed on the basis of long-term rosacea (nasal flushing, erythema, telangiectasia, papulopustules), commonly seen in elderly males. **Differential diagnosis:** Basal cell carcinoma: Especially the nodular ulcerative type, which may be misdiagnosed. Cancer typically presents as an ulcer with rolled edges, growing differently. Sarcoidosis: A systemic granulomatous disease that can sometimes affect the nasal skin. Lymphoma: Cutaneous lymphoma may present as nodules and swelling.

Therapeutic Intervention

The surgery was performed under local anesthesia, using a CO₂ laser for layer-by-layer excision: Preoperatively, the surgical excision range was designed with reference to the normal tissue plane and marked with a marking pen. The local anesthetic was prepared as follows: 10 mL of lidocaine (1%~2%) mixed with 0.1 mg of epinephrine (1:1000 concentration), resulting in a final epinephrine concentration of 1:100,000~1:200,000. The patient was in a supine position, and after routine povidone-iodine disinfection, local infiltrative anesthesia was administered according to the surgical area. Anesthetic was supplemented in a timely manner based on the patient's pain response. After the drug took effect, the CO₂ laser was used for layer-by-layer excision of the proliferative mass, with the Lumenis CO₂ laser set to continuous pulse mode, power adjusted to 5–8 W depending on the depth of the wound, cutting to a level about 1 mm below the surrounding normal tissue. The wound was covered with one layer of sterile paraffin gauze, one layer of saline gauze, and three layers of sterile dry gauze for bandaging. The patient did not experience significant pain 1–2 hours postoperatively, with good intraoperative anesthesia effect and long postoperative analgesia duration. Through careful planning and execution, the team successfully achieved the excision of the nasal tumor. The patient declined histopathological examination during treatment. With the surgical area dressing changed daily with sterile gauze, and the surgical team meticulously managed the postoperative wound, resulting in complete wound healing after 30 days (See Figure 2).

Follow-Up and Outcomes

Follow-up for 1 year. No local recurrence was observed, no scar hypertrophy, and the patient was satisfied with the nasal appearance. Achieved good cosmetic and functional results.

Discussion

Compared to other nasal masses, PhR is a benign and non-invasive tumor. In 2017, the Global Rosacea Consensus Expert Panel (ROSCO) proposed a classification system with six major phenotypes centered on “flushing”, “persistent erythema”, “telangiectasia”, “papules/pustules”, “phymatous changes”, and “ocular manifestations”.⁹



Figure 2 (A) Postoperative anteroposterior view; (B) Postoperative left lateral view; (C) Postoperative right lateral view.

There is no specific immunological diagnosis for rhinophyma. Therefore, the diagnosis of rhinophyma is usually clinical,¹⁰ and it typically occurs in elderly patients, with a significant male predominance.^{4,8} If there are underlying diseases such as heart disease, emphysema, renal insufficiency, or cirrhotic ascites, these are contraindications for general anesthesia. Local anesthesia can broaden the surgical indications¹¹ and can be performed in an outpatient surgical setting. Postoperatively, patients can resume normal activities, which aids recovery and avoids complications associated with traditional anesthesia, such as aspiration pneumonia and lower limb venous thrombosis, with minimal impact on elderly bodies and low treatment costs. This case involves a 67-year-old male patient with a history of hypertension, presenting with giant rhinophyma causing nasal aperture deformity, compressing the upper lip, and affecting normal breathing. Intubation under general anesthesia was not conducive to the surgical operation, so local anesthesia was chosen for the direct excision of the hypertrophic rhinophyma tissue, reducing the patient's general anesthesia surgical risks, with satisfactory effects in the operative procedure and anesthesia time.

PhR also lacks a standardized treatment protocol. Multiple studies recommend surgical excision as treatment.^{7,8} The traditional surgical method involves excising the lesional tissue, followed by skin grafts or flaps. However, skin grafts have a high postoperative contracture rate, and flap repairs require multiple surgeries for reshaping.¹⁰ The skin in the PhR is subject to long-term chronic infection, and direct grafting or flap transplantation on infected wounds carries a high postoperative infection risk and may also alter the nasal skin color and texture. Dermabrasion has poor hemostatic effects, while electrosurgery risks cartilage necrosis or imprecise resection depth.⁶ Given the patient's preference for outpatient treatment, refusal of hospitalization, and the history of hypertension, We adopted a personalized surgical plan for the patient,⁹ using the CO₂ laser for direct excision combined with moist dressing and bandaging treatment, achieving good therapeutic results.⁶ This method has advantages such as simple operation, minimal trauma, less bleeding, and no need for secondary surgery.^{3,12–14} There is a risk of post-surgical pigmentation or scarring. Intraoperative excision of lesional tissue should not be excessive.³ If excision reaches the cartilage layer of the nasal wing, the wound cannot heal through epithelialization and requires flap transfer for repair or the use of expensive artificial materials to cover the wound.¹⁵ Careful preoperative patient assessment, accurate intraoperative surgical techniques, and appropriate postoperative care can reduce the risk of complications after rhinophyma surgery. Postoperative moist dressing changes without pressure bandaging led to wound healing after 30 days of routine dressing changes. The patient's nasal appearance and quality of life improved markedly, with high satisfaction and no complications or cosmetic issues after one year of follow-up.

Conclusion

In this report, we emphasize the surgical value of local anesthesia with CO₂ laser for rhinophyma, reducing blood loss, operation time, and the need for secondary surgery. We will conduct long-term follow-up on the patient, but single-case studies on rhinovegetation have limitations. Future comparative studies will be conducted to enhance the scientific rigor and balance of the research.

Artificial Intelligence Usage Statement

No AI tools were involved.

Ethics Statement

The studies involving humans were approved by Ethics Committee of Xi'an No.3 Hospital. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent was obtained from the patient for the publication of the case details and accompanying images. Institutional approval is not required for publication of this case study.

Disclosure

The author reports no conflicts of interest in this work.

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