PULSED DYE LASER TREATMENT OF LARYNGEAL GRANULOMAS

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Laryngeal granulomas are effectively treated with antireflux therapy and speech therapy. Failure to respond leads to treatment with Botox or surgical excision. We report on the use of the pulsed dye laser for treating chronic granulomas that do not respond to standard therapy. We performed a retrospective review from September 2002 to September 2003. Patients identified with chronic granulomas that were not responding to standard therapy were treated in our office with the pulsed dye laser. Ten patients were identified; the mean age was 58 years. Two patients underwent more than one pulsed dye laser treatment. Five of the 10 had resolution of their lesions, and 3 had a partial response. Two were unchanged. The average follow-up was 6 months, and there were no complications. We conclude that in-office use of the pulsed dye laser is a relatively safe and effective method for treating laryngeal granulomas that do not respond to antireflux therapy and speech therapy.

KEY WORDS — laryngeal granuloma, pulsed dye laser.

INTRODUCTION

Laryngeal granulomas are benign inflammatory lesions of the larynx that are usually found in the posterior glottis, overlying the vocal process of the arytenoid cartilage. The term contact ulcer refers to a superficial ulcerative lesion located in the same anatomic region of the larynx. These two terms are often used interchangeably, but actually represent separate entities or different stages of the same pathologic process. The focus of this paper is laryngeal granulomas.

The underlying cause of these lesions is injury to the posterior glottis. This injury may be mechanical, inflammatory, or both. Mechanical causes include vocal trauma and nonvocal trauma (intubation injury and surgical trauma). Inflammatory causes include laryngopharyngeal reflux, infections, allergy, and idiopathic causes. Most authors agree that vocal trauma is also a major contributory factor in the formation of laryngeal granulomas. Specifically, the use of a low-pitched voice with excessive vocal intensity, habitual throat clearing, and excessive glottal attacks has been implicated. Glottal denervation (pareisis or paralysis) resulting in aerodynamic incompetence and supraglottic compensatory activity can also lead to posterior laryngeal granuloma formation, often at the supraglottic level (higher on the arytenoids). Other studies have even implicated emotional stress as an etiologic factor. Regardless of cause, the histopathology of laryngeal granulomas remains the same.

Historically, voice therapy has been a mainstay of treatment. Chevalier Jackson first described the entity of contact ulcers in 127 patients in 1928. He later reviewed these cases and 47 more in 1935, when he also included examples of vocal cord granuloma. The management of this disease has evolved since that time, but voice therapy has remained a mainstay of treatment. Early approaches included complete voice rest for several months. Peacher and Hollinger, were the first to report that voice therapy alone has better results than surgery followed by vocal rest. Their study showed a benefit from voice reeducation without voice rest. Bloch et al, in 1981, reported the use of "conventional" voice therapy that directed patients to eliminate the vocally abusive habits of coughing, excessive throat clearing, and shouting.

In addition to voice therapy, the nonsurgical management of laryngeal granulomas has included antibiotics, steroids, irradiation, botulinum injection, antireflux therapy, and observation. The use of antibiotics is based on studies that have shown bacteria in the granuloma on histopathologic review. Specifically, Helicobacter pylori has been implicated, and a 1998 study by Hynes did show a benefit in patients positive for H pylori who were treated with antibiotics. Steroids have been used systemically, applied topically, inhaled, and injected directly into the granuloma, but there is not compelling evidence that there is a benefit. There has been support for irradiation in the literature since 1960, when Hollinger and
Johnston \textsuperscript{14} showed benefit in 3 of 4 patients treated with “X-ray therapy” administered to the arytenoid area. Harari et al.\textsuperscript{15} in 1991, reported treatment of a laryngeal granuloma with 1,200 cGy immediately after excision; no recurrence was noted after 3 years. A more recent case report, from 1998, by Mitchell et al.\textsuperscript{16} also supported the value of immediate postsurgical radiotherapy in a patient with recurrent contact ulcer. There are, however, obvious concerns about using irradiation to treat a benign lesion when other treatment options exist. In 1995, Nasri et al.\textsuperscript{17} reported the use of botulinum neurotoxin A (Botox) to aid in the resolution of vocal cord granuloma in patients who are poor surgical candidates or in whom other treatments have failed. Botox is injected into the thyroarytenoid muscle to prevent the forceful adduction of the arytenoids that perpetuates the granuloma. Emami et al.\textsuperscript{18} in 1999, reported injecting Botox in conjunction with a steroid.

An association between laryngopharyngeal reflux and laryngeal granulomas has found strong support in the literature over the past three decades. When acid reflux is demonstrated in a patient with a laryngeal granuloma, aggressive treatment with medical therapy is indicated.\textsuperscript{2} The use of proton pump inhibitors for 2, 4, or 6 months coupled with dietary changes is a well-supported management approach.\textsuperscript{18,19} Observation is an option, even with refractory granulomas, in asymptomatic patients who can be reliably followed clinically.

Surgery remains controversial in the management of laryngeal granulomas because of the high recurrence rate. Widely accepted indications for surgery are airway obstruction, the need to establish a histopathologic diagnosis through biopsy, and failure to respond to medical and/or voice therapy. However, the current literature supports nonsurgical interventions as the primary management.\textsuperscript{4,18,20} Techniques used in surgery have included cold knife excision, laser surgery, and cryotherapy. Support for the use of the laser in the treatment of laryngeal granulomas derives from its precision and its capacity to limit bleeding.\textsuperscript{21} Support for the use of cold instruments to excise the granuloma has come from theoretical concerns about the more extensive thermal injury that may occur with laser excision.\textsuperscript{2} Jaroma et al.\textsuperscript{20} in 1988, reported experience with cryotherapy to ablate vocal process granuloma in 9 of 41 patients who were treated with a variety of measures. The fact that the group treated with cryotherapy actually had the worst outcome prompted the investigators to discourage its use.

Recently, there has been an increasing interest in the use of the 585-nm pulsed dye laser (PDL) in the management of laryngeal lesions, including papillomas and vocal cord dysplasia. Dermatologists have been using the PDL for years; its early uses were for the management of cutaneous vascular lesions, but its indications now include telangiectasias, hypertrophic scars, keloids, and striae.\textsuperscript{22,23} The PDL energy penetrates epithelium without damaging it, and is selectively absorbed by the underlying microvasculature.\textsuperscript{24-28} Because of its epithelial-sparing properties, otolaryngologists have started using the PDL for laryngeal lesions. Franco et al.\textsuperscript{29} in 2002 reported 41 patients with recurrent respiratory papillomatosis of the glottis who were treated with PDL. Twenty-six of the 41 patients were treated with PDL alone, and all had total or near-total resolution without complications such as anterior web formation. In 2003, Franco et al.\textsuperscript{30} reported successful ablation of vocal cord dysplasia without complications in 21 of 57 patients treated with the PDL. In 2004, office-based treatment using the PDL was first demonstrated by Zeitels et al.\textsuperscript{31} They demonstrated that the PDL could be used in the clinic with the patient under local anesthesia by treating 82 cases of recurrent glottal papillomatosis and dysplasia. Although the procedure was aborted in 5 cases, the remaining 77 patients all demonstrated at least 25% disease regression, with no reported complications. These studies have shown the PDL to provide a relatively safe and effective treatment for certain laryngeal disorders.\textsuperscript{29,30} and it may be used in a clinic setting with the patient under local anesthesia.\textsuperscript{31,32} In this article, we report our initial experience using the PDL and local anesthesia to treat laryngeal granulomas in a clinic setting in a group of 10 patients who failed to respond to traditional management including voice therapy and aggressive antireflux therapy.

MATERIALS AND METHODS

We performed a retrospective review of 10 patients with laryngeal granulomas that were refractory to voice and reflux therapy who were identified at the Center for Voice and Swallowing Disorders of Wake Forest University Baptist Medical Center between September 2002 and September 2003. All 10 patients signed a written informed consent to have PDL treatment. The procedure is done in the office with the patient seated in an examination chair, without general anesthesia or sedation. The procedure is performed as previously described by Zeitels et al.\textsuperscript{31} with the following differences. For topical anesthesia, the nasal cavity is first sprayed with 1:1 oxymetazoline hydrochloride 0.05% and lidocaine hydrochloride 4% and is then packed with cotton pledgets soaked with the same solution. In addition, one spray of 20% benzocaine is administered to the oropharynx. The nasal
clearing, and vocal fatigue. All patients had laryngopharyngeal reflux according to pH probe studies documenting at least one pharyngeal reflux event over the 24-hour study period, and all were treated with twice-daily administration of proton pump inhibitors for more than 2 months before PDL treatment. Also, for at least 2 months before PDL treatment, all patients had worked with a speech-language pathologist to eliminate vocally abusive habits. Patients who failed to show any response to this therapy were offered PDL treatment. Two patients underwent more than one PDL treatment. The mean age was 58 years. Five of the 10 patients had resolution of their lesions, and 3 had a partial response. Two were unchanged. The average follow-up was 6 months, and there were no complications.

DISCUSSION

Voice therapy and antireflux therapy are the primary treatment in most patients with laryngeal granulomas. Intraoperative surgical resection is avoided because of the cost associated with general anesthesia and the high recurrence rate. In general, surgery has been reserved for cases of airway obstruction, ruling out carcinoma, or patients in whom voice and antireflux therapy have failed. The current study supports the findings of Zeitels et al. in that use of the PDL was demonstrated to be effective and effective under local anesthesia in an office-based setting. The PDL has ideal properties for use in the office with local anesthesia, because it spares the epithelium and is selectively absorbed by vascular tissue, thereby minimizing the risk of bleeding. This photoangiolytication of the microcirculation of granulomas does not treat the underlying inflammatory and/or traumatic causes of granulomas. Thus, results similar to previously reported surgical outcomes may be anticipated, as demonstrated in the current study. However, the lack of associated morbidity is what differentiates the use of the PDL from intraoperative surgical treatment. The current study involved patients in whom antireflux therapy and voice therapy failed. Given the lack of morbidity with the PDL, future indications may evolve to include office-based PDL treatment in conjunction with medical and behavioral management, rather than reserving it for cases refractory to medical and behavioral management.

REFERENCES


