

Ear Candles—Efficacy and Safety

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Ear candles are a popular and inexpensive alternative health treatment advocated for cerumen removal. A hollow candle is burned with one end in the ear canal with the intent of creating negative pressure and drawing cerumen from the ear. If effective, significant savings could result from the use of ear candles. This study evaluates the efficacy and safety of this alternative method for cerumen management. Tympanometric measurements in an ear canal model demonstrated that ear candles do not produce negative pressure. A limited clinical trial (eight ears) showed no removal of cerumen from the external auditory canal. Candle wax was actually deposited in some. A survey of 122 otolaryngologists identified 21 ear injuries resulting from ear candle use. Ear candles have no benefit in the management of cerumen and may result in serious injury.

LARYNGOSCOPE, 106:1226-1229, 1996

INTRODUCTION

Alternative medical therapies refer to those treatments that do not conform to the usual standards of the medical community. An estimated one third of the United States population subscribes to such treatments.¹ These alternative therapies are often not investigated as traditional medical treatments are for efficacy and safety.

Ear candles are a product promoted by alternative health practitioners primarily for cerumen removal. Their use requires placing a hollow candle into the external auditory canal (EAC) and lighting the opposite end (Fig. 1). The lighted candle is thought to create a vacuum which draws cerumen and other impurities from the EAC. A dark brown waxy substance purported to be cerumen plus EAC debris is left in the stub of the candle (Fig. 2).

Ear candle use appears to be fairly widespread and increasing. One wholesale ear candle distributor in Seattle sells approximately 1000 candles per week (personal communication, M. Ruffner, Rainbow Ear

Candle Distributor). Their use in managing cerumen is gaining popularity due to wide publicity at alternative health fairs and in the lay press. Television news and talk shows in the Pacific Northwest have promoted their use as an inexpensive, effective treatment for "earwax." Ear candles have also received national endorsement by notable members of the press. Dave Barry, a syndicated columnist for Knight-Ridder newspapers, has popularized their use in an article that was distributed nationally.²

Alternatives to standard medical procedures should not summarily be dismissed. In this age of health care cost consciousness, nontraditional methods may be one pathway to contain or lessen the costs of providing care. For example, use of ear candles as a home remedy costs approximately one fifth of what it costs for a physician to remove cerumen in an office setting. Furthermore, many widely used conventional treatments for cerumen removal, such as irrigations performed in primary care offices, are known to result in serious complications.³ Obviously, the efficacy and safety of alternative treatments must be documented before they can be utilized as potential cost savers.

This study was undertaken to investigate the usefulness of ear candles in the management of cerumen. Because ear candle treatments require the patient to be in proximity to an open flame, the safety of these devices was also studied.

MATERIALS AND METHODS

An investigation of the theory behind ear candle use was carried out to determine if a "vacuum" was created by the burning candle. An ear candle was placed into a Plexiglas canal with the same dimensions as an EAC. This canal was separated from a second canal of similar dimensions by a thin plastic membrane bolted in place over an O ring to obtain a seal. Calibration with two tympanometers (GSI 33 middle ear analyzer, Grason-Stadler, Littleton, Mass.) confirmed that as little as 5 mm H₂O pressure change in the upper canal could be detected by the probe in the lower canal. With a burning candle (Rainbow Ear Candles, Seattle, and Quality Health Products, Canton, Ohio) in the upper chamber and a tympanometer probe in the lower canal in reflex mode, the pressure within the upper canal was continuously measured (Fig. 3). Each candle was burned to a length of approximately 2 inches. Between each tympanometric trial the plastic membrane separating the two chambers was replaced. In the course of doing this, it was noted that a powder was deposited on the membrane. This substance was analyzed with mass spectroscopy as described below.

Presented at the Meeting of the Western Section of the American Laryngological, Rhinological and Otolaryngological Society, Inc., Marina Del Rey, Calif., January 14, 1996.

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Supported by a grant from the William G. Reed Fund for Research in Otolaryngology.

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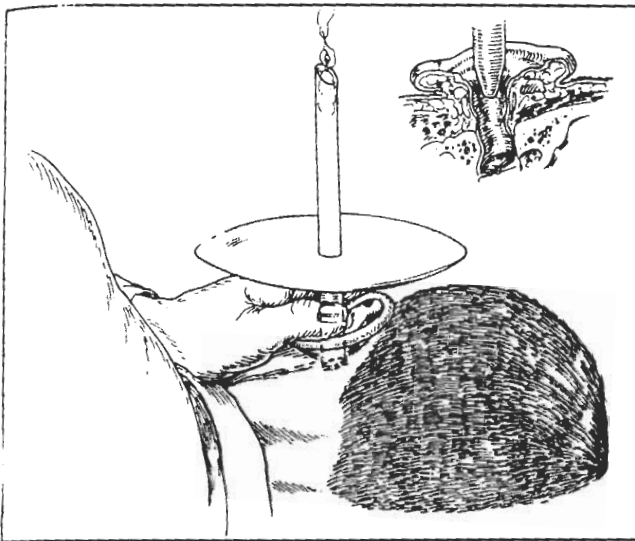


Fig. 1. Ear candle treatment in progress.

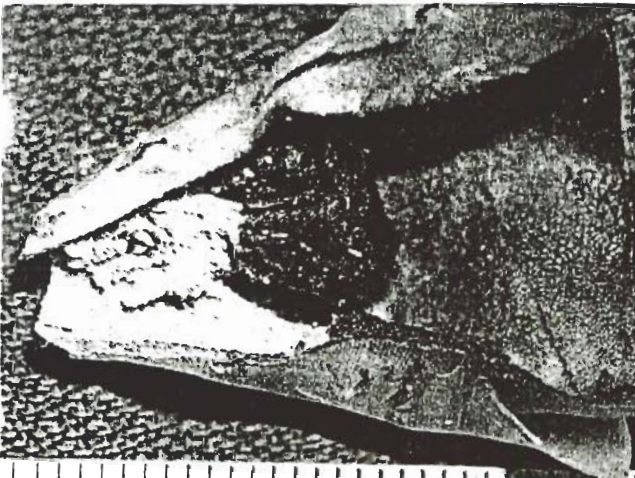


Fig. 2. Ear candle stub cut open after use to display contents.

A clinical study was carried out to assess the effects of ear candles in vivo. Four informed and consenting subjects, two with no cerumen in their ears and two with bilateral cerumen impactions, had both ears treated with ear candles. Commercially available ear candles were used and the directions in the accompanying brochures were followed exactly. The subjects were placed on their side and the tapered end of an ear candle was firmly seated into the meatus of the EAC so as to obtain a seal. A foil-covered plate with a hole for the candle was used to protect the subject's face from falling ash and the patient's hair and face were further protected with towels. The candle was then lit and allowed to burn until it was 2 inches above the foil covered plate (3 inches total length), at which time it was extinguished. Pretreatment and post-treatment photographs of the ear canals were taken with a zero degree 1.9-mm otoendoscope (Richard Wolf, Vernon Hills, Ill.).

The contents of the candle stubs, as well as the unknown powder deposited in the experimental model, were analyzed with a Hewlett Packard 5890 gas chromatograph (Wilmington, Del.) coupled to a Kratos Profik HV-3 mass

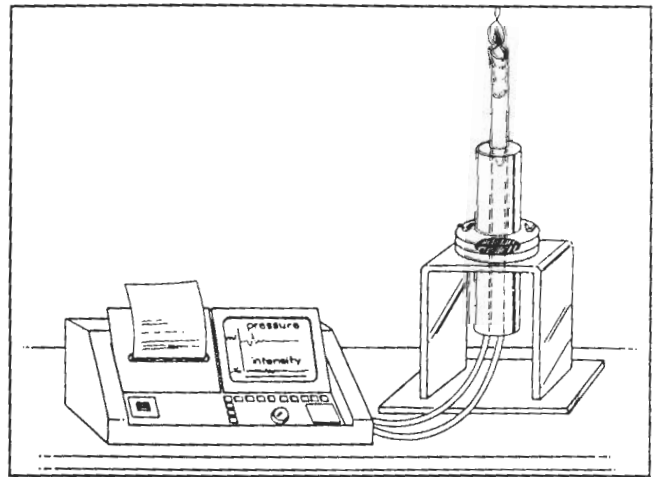


Fig. 3. Pressure measuring device with burning ear candle in upper canal and tympanometer probe in lower canal.

spectrometer (Manchester, U.K.) using a temperature program of 150°C for 2 minutes to 300°C at 10°C per minute. The column in the gas chromatograph was Supelco SPB-1, 30 m long, 0.2-mm inner diameter (Bellefonte, Pa.).

A survey on ear candle complications was sent to the membership of the Northwest Academy of Otolaryngology—Head and Neck Surgery (Fig. 4). The survey asked if otolaryngologists were aware of patients in their practice using ear candles and whether they had seen any complications of ear candle use. If complications were reported, respondents were asked to describe the injury, the treatment required, and any long-term sequelae.

RESULTS

Basic Science Evaluation

Twenty tympanometric trials with two different candle types (10 trials with each candle) were carried out. No negative pressure was generated by any of the burning ear candles at any point during the trial.

The unknown substance deposited on the membrane of the experimental model as well as the contents of the ear candle stubs from the subjects tested were identified with mass spectroscopy. A computer compared the mass spectrograms of the unknown sample molecules to a large database of known molecules. This analysis revealed the sample to be composed of multiple alkanes, which are found in candle wax. The gas chromatograph mass spectrogram of one sample molecule, pentacosane, is shown in Figure 5. None of the constituents of cerumen were identified.⁴

Clinical Study

A total of eight ears—four with no cerumen and four with cerumen impaction—underwent treatment with an ear candle. No cerumen removal was apparent in the ears with impacted wax (Fig. 6). Furthermore, in the process of firmly seating the candle in the EAC meatus, one subject with bilateral wax impactions experienced the sensation of cerumen being pushed me-

| | |
|--|-----|
| 1. Are you aware of any patients in your practice who use ear candles? | Y/N |
| 2. Have you seen any complications resulting from the use of ear candles? | Y/N |
| A. If yes, how many injuries have you seen? | |
| 1. Number of patients _____ | |
| 2. Number of ears (if different from above) _____ | |
| B. Which of the following injuries have you seen? | |
| 1. Burn of hair or scalp? | Y/N |
| 2. Burn of pinna? | Y/N |
| 3. External auditory canal burn? | Y/N |
| 4. Tympanic membrane perforation? | Y/N |
| 5. Hearing loss? | Y/N |
| 6. Other (please specify) _____ | |
| 3. Please provide patient age, sex, injury, treatment required, duration of recovery period, permanent sequelae of the injury, and any other pertinent information for each complication listed. | |

Fig. 4. Ear candle complications survey.

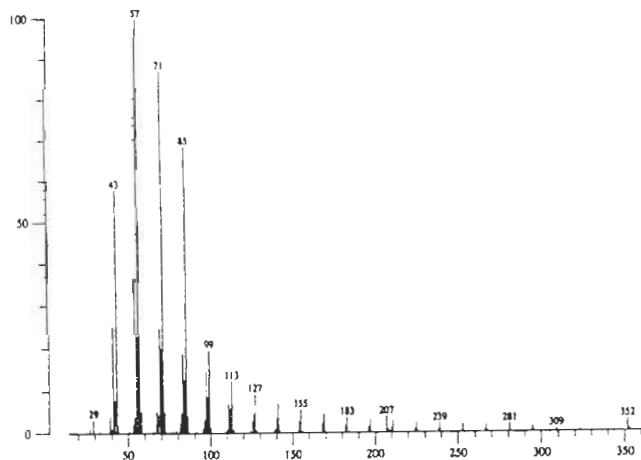


Fig. 5. Gas chromatography mass spectrogram of pentacosane, a long chain hydrocarbon found in candle wax.

dially (Fig. 6, bottom). Similar findings were seen in the other impacted ears before and after treatment.

Candle wax was deposited in two of the four cerumen-free ears that were tested (Fig. 7). No candle wax deposit was observed in the cerumen-impacted ears, presumably because the end of the candle was occluded by cerumen during use. No further testing was carried out on human subjects due to the concern for causing injury.

Epidemiological Survey

Of the 163 surveys that were sent, 122 were returned for a 75% response rate. One third of the respondents (40 physicians) were aware of ear candle use among one or more of their patients. Overall, 14 physicians had treated patients with complications of ear candle use. There were 21 ear injuries among 20 patients. These included 13 burns of the auricle and external auditory canal, 7 partial or complete occlu-

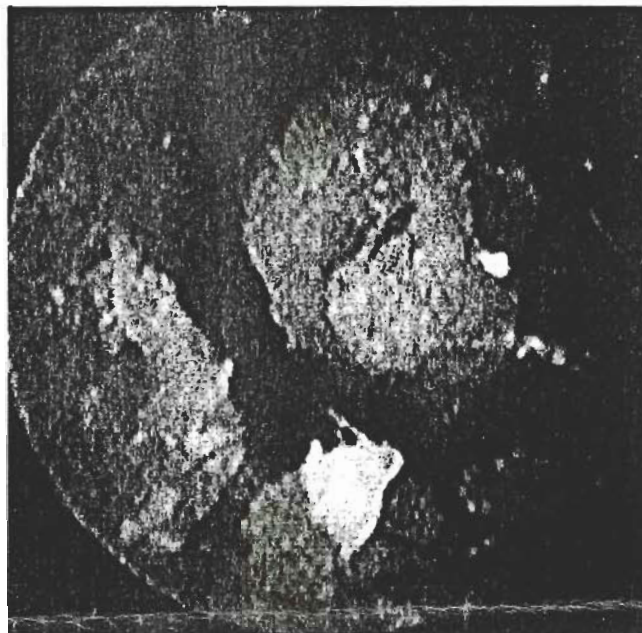
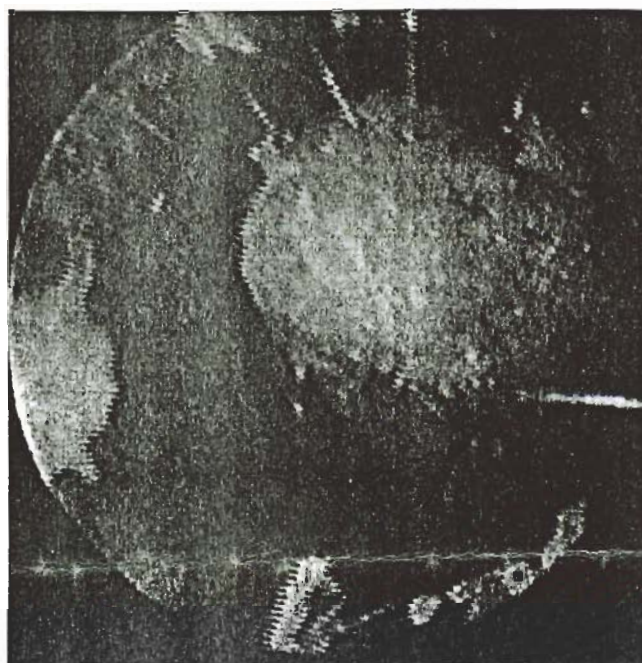


Fig. 6. **Top.** Ear canal with cerumen impaction before ear candle treatment. **Bottom.** Ear canal with cerumen impaction after ear candle treatment. Note impression left in cerumen by ear candle tip.

sions of the ear canal with candle wax (Fig. 8), and one tympanic membrane perforation. External otitis and temporary hearing loss were secondary sequelae in 3 and 6 patients, respectively. The total number of complications, 30, was greater than the number of ears injured, because several of the ears sustained more than one injury.

DISCUSSION

Alternative medical therapies compete with standard medical practices more frequently than is gener-

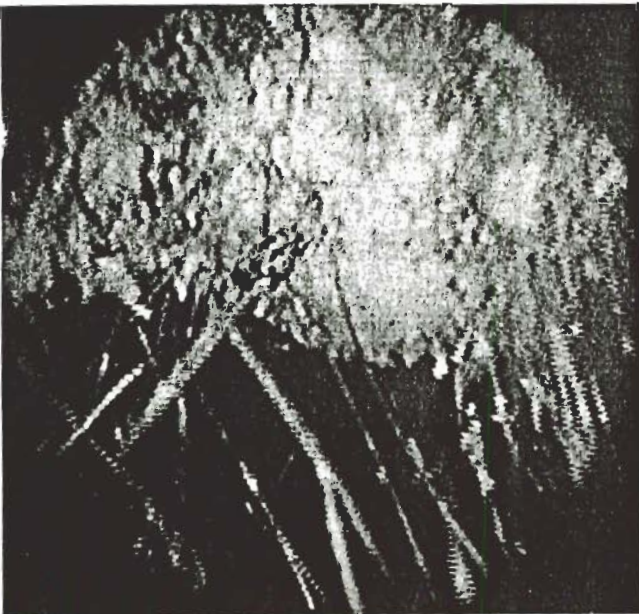
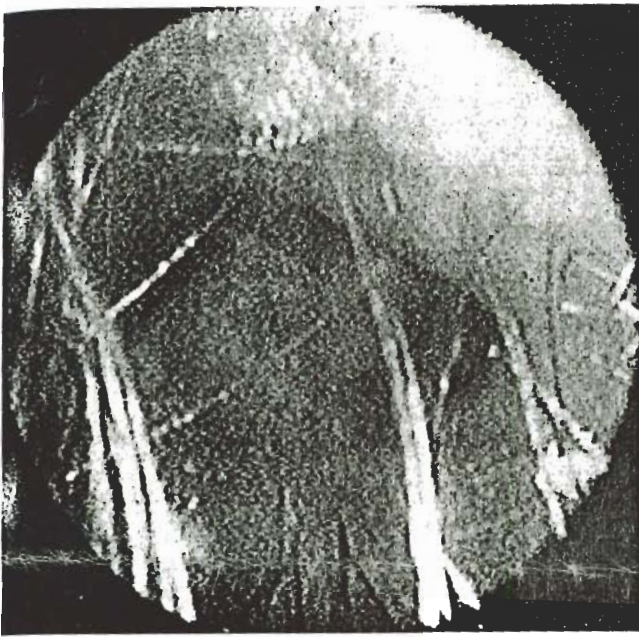


Fig. 7. **Top.** Ear canal with no cerumen before ear candle treatment. **Bottom.** Ear canal with no cerumen after ear candle treatment. Note deposition of candle wax.

ally recognized. Eisenberg et al., in a nationwide survey of 1539 people, estimated that 34% of American adults use alternative therapies.¹ The highest use of unconventional therapies occurred in nonblack persons from 25 to 49 years of age with relatively more education and higher incomes. Alternative treatment use was also significantly higher among people living in the Western United States. Interestingly, 83% of those who used alternative therapy also sought treatment for the same condition from a medical doctor. However, 72% of those people did not inform their doctor they had done so.

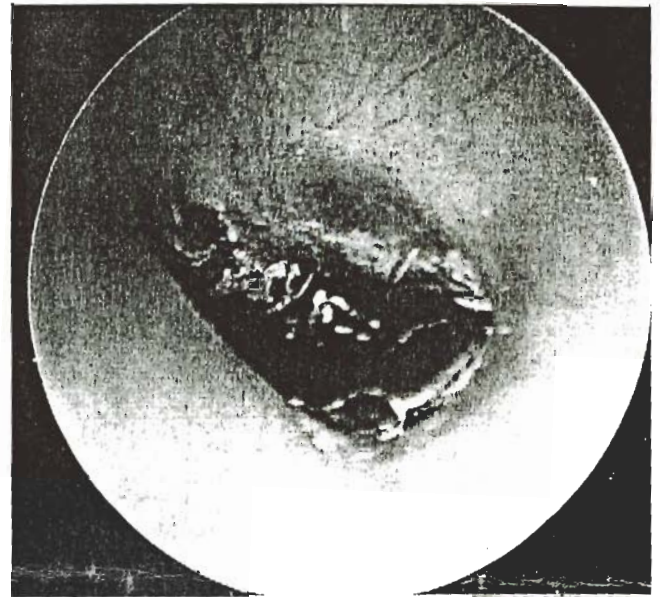


Fig. 8. Beeswax adherent to tympanic membrane as a complication of ear candle treatment.

Because many conventional treatments have limited effectiveness, particularly in the realm of chronic disease and cancer, the Office of Alternative Medicine was recently created at the National Institutes of Health.⁵ Its role is to promote the fair and thorough evaluation of alternative therapies. It is important for otolaryngologists to follow the lead of the Office of Alternative Medicine at the NIH and rigorously evaluate alternative therapies that pertain to their specialty. With a large and growing number of Americans using these therapies, it is important to ascertain if they are beneficial, innocuous, or hazardous. Ear candles, unfortunately, fall into the latter category. They have no proven benefit in the management of cerumen and they may produce a number of complications that require conventional medical treatment.

SUMMARY

This investigation has demonstrated that ear candles do not generate any negative pressure and they do not remove cerumen from the EAC. Their use may also result in a number of complications. Physicians need to be aware of the dangers associated with ear candle use and counsel their patients accordingly.

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