

Galbreath technique: a manipulative treatment for otitis media revisited

DALE PRATT-HARRINGTON, DO

Otitis media is a common disorder that results in numerous visits to the physician each year. Antimicrobials, antihistamines, steroids, and surgery have all been used to treat otitis media; however, the literature makes little mention of osteopathic manipulative treatment in this regard. This article describes a technique that was first described in 1929 by William Otis Galbreath, DO. By simple mandibular manipulation, the eustachian tube is made to open and close in a “pumping action” that allows the ear to drain accumulated fluid more effectively. Physicians can easily teach this procedure to parents for use at home.

(Key words: otitis media, osteopathic manipulative treatment, Galbreath technique)

Otitis media is the most common bacterial infection diagnosed in children.^{1,2} With an estimated 31 million visits to the physician due to otitis media in 1986,³ this condition afflicts one of eight children under 10 years of age.⁴ The total expenditure to deal with this problem has been estimated at \$3.5 billion per year.⁵ Long-term morbidity of the condition includes conductive hearing loss, which, if left unattended, can lead to abnormalities in speech, language, and behavioral and cognitive development.⁵ Because of these sequelae, the medical journals and popular press publish many articles annually on the treatment and prevention of this disorder; treatments include antibiotics, immunizations,⁶ and new surgical techniques,^{7,8} including adenoidectomies.⁹ Even with this high interest in otitis media, few published articles explore osteopathic manipulative treatment (OMT) for this disease. An intraoral technique for eustachian tube manipulation has been described¹⁰; however, our experience sug-

gests that children generally do not tolerate this procedure well. This article describes a noninvasive, easy-to-perform technique first introduced in 1929 by William Otis Galbreath, DO.¹¹ His technique of simple mandibular manipulation helps the middle ear drain and leads to quicker resolution of the problem.

Otitis media

Definition and pathogenesis

Otitis media is defined as inflammation, usually due to viral or bacterial infection, of the middle ear.¹² The pathogenesis often follows this pattern: (1) patient develops an upper respiratory tract infection throughout the mucosa; (2) inflammation of the upper respiratory tract leads to congestion in the eustachian tube, which leads to an accumulation of secretions in the middle ear; and (3) secretions result in a proliferation of bacteria within this pool, leading to symptomatic otitis media. The bacteria found in this fluid include *Haemophilus influenzae*, *Streptococcus pneumoniae*, and *Moraxella catarrhalis*.

Anatomy

Eustachian tube dysfunction represents the primary problem leading to otitis

media.^{13,14} The eustachian tube (also known as the auditory tube; *Figure 1*) opens from the anterior wall of the tympanic cavity. From the middle ear, it extends anteriorly, medially, and caudally in a bony tube named the semicanal that lies within the temporal bone. The medial and upper portions of the lateral walls of the eustachian tubes are composed of a folded piece of cartilage; the rest of the tube consists of membrane. The cartilaginous portion of the tube extends to the wall of the pharynx, where the opening resides on the interior aspect of this structure. The tube, usually closed at the pharyngeal end, occasionally opens via the tensor veli palatini muscle. This muscle arises partially from the eustachian tube; when it contracts, it opens the tube and equalizes the atmospheric pressure (this equalization occurs commonly when yawning or swallowing).

The innervation of this muscle arises from the tympanic plexus of the glossopharyngeal nerve. Anatomists believe that this innervation, when not complete early in life, decreases the muscle's ability to open the tube in infancy. The angle of the eustachian tube provides another etiologic factor of otitis media. At infancy, the tube is approximately 10° to horizontal; later in life the angle increases to 45°. This allows the secretions that accumulate in the middle ear to drain more effectively. The length of this structure also increases from 10 mm in infancy to approximately 18 mm in adulthood. This increased length decreases the pathogens' ability to migrate from the nasopharynx into the middle ear.

Fluid that is normally produced in the middle ear accumulates there. The ear normally eliminates this fluid via contraction of the tensor veli palatini. This opens the distal portion of the eustachian tube, allowing the fluid to drain from the ear, as well as equalizes the pressure between the middle ear and the atmosphere. With eustachian tube dysfunction, drainage does not occur, creating a rich media for bacteria to proliferate, leading to inflammation and pain.

During the acute stages of the disease, the region shows the classic signs of inflammation: erythema and swelling.

Dr Pratt-Harrington is an adjunct faculty member, Ohio University College of Osteopathic Medicine, Grosvenor Hall, Athens, Ohio.

Correspondence to Dale Pratt-Harrington, DO, 6539 Hudnell Rd, Athens, OH 45701.

Figure 1. *Anatomy of the eustachian tube (auditory canal). Dysfunction of this tube is a major etiologic factor of otitis media.* (Reprinted with permission from Netter FH. Atlas of Human Anatomy, Summit, NJ: Novartis Medical Education, 1989. All rights reserved.)

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At the microscopic level, dilatation and increased permeability of the capillaries can be seen. This leads to edema of the lamina propria and leukocyte infiltration (consisting of polymorphonuclear leukocytes). If left untreated, and the disease does not spontaneously resolve, a marked increase in the number of ciliated and secretory epithelial cells (known as metaplasia) results. Researchers do not know if this change occurs as a result of mutation of one cell type to another or a simple replacement of cells; in either

event, this metamorphosis occurs. Regardless of their origin, the number of ciliated cells and goblet cells markedly increase. Because of the increased numbers of goblet cells, mucoid effusions become evident.

If still left untreated, otitis media enters the chronic phase. The largest change is the marked increase in numbers of mononuclear cells, such as macrophages, lymphocytes, and plasma cells, which cause tissue destruction; granulation fibers then replace the aforementioned

destroyed tissue. Finally, where this granulation tissue contacts bone, bone resorption takes place.¹⁴

Modes of therapy

Antimicrobials, antihistamines, steroids, and surgery have all been used to treat otitis media; however, the literature makes little mention of osteopathic manipulative treatment in this regard.

Antibiotics—Most practitioners consider antibiotics to be the first line of therapy for this condition. However, due to



Figure 2. Galbreath technique for treating otitis media. The patient is either supine or sitting on the physician's (or parent's lap). The physician turns the child's head so that the affected ear faces away; with the operator's hand that is opposite of the affected ear, the operator contacts the child's mandible on the affected side and applies a downward and transverse mild force on the mandible that crosses the face. This is repeated in a slow rhythmic application of force (about 3 to 5 seconds per round) for 30 to 60 seconds.

increased resistance to antimicrobials, as well as the theory that many cases of otitis media are inflammatory reactions and not bacterial in origin, many physicians strongly challenge this treatment option.^{15,16} In the United States, many physicians still prescribe amoxicillin for otitis media, believing that by destroying bacteria, the inflammation will decrease and thus lead to increased eustachian tube drainage. However, the marked increase in bacterial resistance to this medication often results in the use of more expensive, broader-spectrum agents. Again, as the bacteria develop resistance to the assortment of antibiotics used, this form of treatment will become less efficacious.

Antihistamines and steroids—Healthcare providers commonly use antihistamines such as brompheniramine maleate (Dimetapp) for treating otitis media. Theoretically, by decreasing histamine release, inflammation of the surrounding tissues of the eustachian tube usually will be reduced, allowing increased drainage of the middle ear. Clinicians believe that

antihistamines also generally decrease the amount of fluid being secreted by the middle ear. Drowsiness, the main side effect of these agents, may hamper the quality of life in some patients.¹⁷ In addition, antihistamine use has not proven to be efficacious in the treatment of otitis media.^{2,18} Currently, the non-sedating class of antihistamines has not been approved for the treatment of this condition.

Steroids, such as the liquid pediatric preparation of prednisone, have also been investigated. Again, physicians prescribe steroids to decrease the inflammation in the regions of the middle ear as well as the surrounding tissues to enhance drainage. Although this treatment option appears to be theoretically impressive, study results indicate a variety of results¹⁹; some researchers currently do not recommend steroids for otitis media, either acute or with effusion.²

Surgery—If the aforementioned modes of therapy fail to relieve otitis media, patients are most commonly referred to an otorhinolaryngologist for possible sur-

gical intervention. Surgical options include tympanocentesis to drain and culture the fluid, tympanotomy with tube placement, and adenoidectomy.

Tympanotomy tubes not only drain the middle ear of accumulated fluid, but equalize the pressure between the outside of the body and the middle ear, much as the eustachian tube does. This technique has a high success rate; however, in many cases, general anesthesia is required for placement of these tubes, and although general anesthesia is much safer than in the past, there are still risks.

Adenoidectomy has been proposed as a treatment for otitis media.⁸ In the late 1800s, Politzer²⁰ postulated that the close proximity of the adenoids to the eustachian tube would cause obstruction to the latter when the adenoids become inflamed. However, studies by Hibbert and Stell²¹ revealed no differences between the adenoids of people with serous (non-bacterial) otitis media and those of control populations. Therefore, they postulated that it was the seeding of the bacteria on the enlarged adenoids into

the eustachian tube that caused acute, bacterial otitis media.⁸ Thus by removing the adenoids, the bacteria causing the infections would be removed as well. But, as previously mentioned, surgery carries risks, and these must be taken into consideration when deciding whether to perform this procedure.

Manipulative techniques—Recently, Heatherington¹⁰ described an intraoral manipulative technique for the treatment of otitis media. T.J. Ruddy, DO, also described this technique.²² Apparently, Curtis H. Muncie, DO, originally described this procedure in the 1920s (specific reference was not found; however, numerous physicians credit Muncie with originating this technique). With this procedure (known to many as the “Muncie technique”), the physician directs the patient to either a seated or supine position. The physician, using a gloved or cotted finger, reaches into the mouth to a point near the low end of the posterior tonsillar pillar, then curves the fingertip cephalad and slightly lateral to Rosenmüller’s fossa (posterior to the opening of the eustachian tube). By lightly pumping on this structure, the eustachian tube is made to open, allowing normal function to resume.

This technique was taught in osteopathic schools well into the 1960s by osteopathic leaders such as A.J. Price, DO, and Dwight Strietenberger, DO. However, because of the invasiveness of this technique, many clinicians hesitate to use this procedure. It is perceived by the physician to be too traumatic to the young patient who already has a fear of the physician. Further, if the back of the tongue is accidentally palpated, expulsion of stomach contents results.

Another powerful manipulative technique, known as the “Galbreath technique,” provides both a safe and easy method to relieve otitis media.

Galbreath technique

This method, first described in 1929 by William Otis Galbreath, DO, is a simple procedure that can be easily taught to parents and caregivers. By manipulating the mandible, the physician theoretically increases the blood flow to and through

the region by alternately compressing and releasing the pterygoid plexus of veins and lymphatics in the region. These vessels constitute the primary drainage path for the middle ear and eustachian tube. Also, the fascial coverings of the peripharyngeal muscles, to some extent, must be stretched and released. During the procedure, the physician transmits these mechanical tensions to the membranous inferior wall of the eustachian tube, either directly or via the tensor veli palatini muscle. In either event, this technique may create a “pumping action” of the eustachian tube, alternating the pressures within the middle ear and eustachian tube and thus enhancing drainage of the middle ear into the pharynx.²³

The physician can perform this technique by either placing the child in the supine position (as originally described) or in the physician’s or parent’s lap (my preference, as it makes the patient less apt to squirm). The physician then turns the child’s head so that the affected ear faces away; with the operator’s hand that is opposite of the affected ear (that is, if the child has otitis media on the right side, the operator uses the left hand), the operator contacts the child’s mandible on the affected side and applies a downward and transverse mild force on the mandible that crosses the face (*Figure 2*). This is repeated in a slow rhythmic application of force (about 3 to 5 seconds per round) for 30 to 60 seconds. As stated, this technique can be taught to the patient’s guardian and performed approximately three times daily. Drainage resulting from this technique provides relief of pain and of the infection.

Case study

A 14-month-old girl presents with severe otalgia on the right side. She is pulling on her right ear, and the symptoms have been present for approximately 6 hours. The patient had had a previous episode of this condition approximately 4 months earlier. At that time, the physician prescribed amoxicillin for 10 days, with a repeat dose due to incomplete resolution of her condition.

At physical examination, vital signs were temperature, 102.8°F; pulse, 118

beats/min; and respirations, 24. Patient’s head was normocephalic and atraumatic, and her nose and throat were slightly erythematous and edematous. Examination of the right ear revealed a red, bulging tympanic membrane, nonmovable with pneumatic otoscopy. The rest of the physical examination was unremarkable.

Acute otitis media was diagnosed, and the patient was prescribed amoxicillin for a 10-day course. The patient also underwent the Galbreath technique in the office. Within 30 minutes of the treatment (before filling the prescription, thus without the medication), the child’s temperature was reduced to 99.2°F, and the physical findings revealed a marked decrease in the erythematous changes as well as the edema. The patient appeared to be more comfortable. The patient completed the course of antibiotics, and her mother applied the Galbreath technique twice daily. The otitis media resolved, and the patient underwent this manipulation whenever symptoms of otitis media began again. The patient has not been placed on antibiotics for this condition since.

Comments

Much controversy surrounds the treatment for otitis media, and the treatment protocols change constantly. Because physicians commonly prescribe antibiotics, the infecting bacteria have begun to develop resistance to many of these medications. Commonly, patients undergo several courses of medications before finding one that eradicates the bacteria. Multiple-course therapy is also an expensive proposition. Physicians still debate the use of steroids and decongestants for treating otitis media. Finally, tympanocentesis with tube placement, though effective, is a surgical procedure that does include risks.

The Galbreath technique is a safe and easy manipulative method and offers a noninvasive, simple treatment that can be taught to patients’ parents. Because of this, continuous treatment can be added to the traditional medicinal regimens—possibly resulting in a faster resolution of the problem. Also, if the par-

ents notice the early symptoms of otitis media and apply this technique, the need for medication may be entirely averted, thus saving time and money for all involved.

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Review



Fungal Diseases of the Lung

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Two world-renowned experts on fungal diseases of the lung have collaborated again to produce an outstanding publication. This completely updated book provides comprehensive, practical guidance for pulmonary specialists, infectious disease specialists, and general internists. Chapters focus on specific diseases and cover epidemiology, pathophysiology, clinical manifestations, and treatment. Both the immune-competent and the immune-incompetent patient presentations are discussed, and recent modes of therapy are thoroughly reviewed in a practical setting. An impressive component of this edition is information about numerous algorithms for not only treatment, but also prevention.

This book is a valuable contribution to every physician or hospital library, particularly for those who care for patients at risk for fungal disease.

Gilbert E D'Alonzo, DO
Editor in Chief