

cases per 100,000 in 1990 ($P < .001$). Between 1980 and 1990, the annual incidence of acute epiglottitis in adults remained nearly constant at 1.8 cases per 100,000. Consequently, the ratio of the pediatric annual incidence to the adult annual incidence of epiglottitis has dropped from 2.6 in 1980 to 0.4 in 1990, and adults are now at greater risk than children.

The decline in the incidence of acute epiglottitis in children began in 1986, a year after the Haemophilus b conjugate vaccines were introduced to combat more invasive *H influenzae* type b-caused diseases such as meningitis and septic arthritis. The American Academy of Pediatrics currently recommends giving a three-dose regimen of Haemophilus b conjugate vaccine to infants beginning at age 2 months.

Acute epiglottitis in children will not be eliminated. Some children will not receive the vaccine, and others will be incompletely immunized. Other organisms than *H influenzae* type b and other types of *H influenzae* may become major causes of epiglottitis.

Epiglottitis occurs most frequently in children aged 2 to 5 years. A child with acute epiglottitis typically has symptoms of fever, sore throat, odynophagia, muffled voice, dyspnea, stridor, and drooling and often sits erect to improve the airway. Blood cultures are positive for *H influenzae* in 50% to 75% of cases.

Management is begun by stabilizing the airway with an endotracheal tube or, if necessary, a tracheotomy. Treatment with antibiotics against β -lactamase-producing *H influenzae* is initiated. Hospitals should have a treatment protocol established for children who may have epiglottitis.

In contrast to children, most adults do not have signs or symptoms of airway obstruction. Often their only symptoms are sore throat and odynophagia. Some adults do not seek medical attention or are diagnosed as having pharyngitis. Clinicians should suspect epiglottitis in patients who have a severe sore throat and odynophagia, especially if they have a muffled voice or drooling. A routine oropharyngeal examination does not exclude epiglottitis because 56% of patients have a normal oropharynx. Indirect laryngoscopy is the most accurate way to diagnose epiglottitis because, unlike in children, the procedure is much less likely to provoke laryngospasm and airway compromise. As with children, both the supraglottis and the epiglottis may be affected.

Although acute epiglottitis is usually caused by *H influenzae* in children, *H influenzae* is seldom the cause in adults. Blood and oropharyngeal cultures in adults have a low bacteriologic yield, but many organisms have been cultured from the adult larynx.

Medical management in adults includes antibiotic therapy for *H influenzae*, *Staphylococcus aureus*, group A β -hemolytic streptococcus, and *Streptococcus pneumoniae*. The use of parenteral corticosteroids remains controversial and awaits a prospective controlled study.

In adults as well as in children, maintaining an adequate airway is the main concern. Each patient must be

evaluated according to a practitioner's clinical judgment. If any question of airway compromise exists, the safest course of action is to secure the airway. Respiratory distress, stridor, and sitting upright are the major signs and symptoms associated with the need for adult airway intervention. Adults who do not have signs or symptoms of upper airway obstruction can be treated medically under close observation in a hospital unit that has staff capable of securing an airway if necessary. Intubation or tracheotomy are necessary for patients who have progressive supraglottic edema or stridor.

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Phonosurgery—Outcomes of Varied Techniques

WITHIN RECENT YEARS there has been pressure on the medical profession to verify the usefulness of surgical procedures. Thus, outcomes research has moved to the forefront as one of the most important areas of scientific investigation. Because laryngology and phonosurgery (surgical therapy to alter vocal quality) are relatively new subspecialties, the clinical efficacy of many of these newer procedures is of general interest.

Several studies have shown substantial sustained improvement in quantitative measures of vocal function following type I medialization thyroplasty for patients with unilateral vocal fold paralysis. (In this procedure, using local anesthesia a small Silastic implant is used to medialize the vocal fold through a window cut in the thyroid cartilage.) In addition, the efficacy of the use of botulinum toxin in the treatment of adductor spasmodic dysphonia has been successfully shown. Whereas thyroplasty improves the voice in patients with unilateral vocal fold paralysis and has been shown to be superior to administering polytetrafluoroethylene (polytef; Teflon), patients after thyroplasty still have problems speaking in loud situations and complain of voice fatigue with extended use. This is related to an inability of the thyroplasty to close a large posterior gap and prevent atrophy of the muscle of the vocal fold. In contrast, adducting the arytenoid and reinnervating the nerve can alleviate these deficiencies, but no randomized studies have been published that compare these techniques on unilateral vocal fold paralysis. Furthermore, there have been no published reports comparing the efficacy of these techniques in patients with paretic or bowed vocal folds due to senile aging or neuromuscular disorders.

Most laryngologists agree that thyroplasty improves the voice in patients with vocal fold bowing 60% of the time and that about one in four have dramatic improvement. These results are probably related to the observation that a weak voice and vocal fold bowing are a result of a number of varied causes, including neuromuscular weakness, loss of the lamina propria, and various neuromuscular disorders such as myasthenia gravis, multiple sclerosis, amyotrophic lateral sclerosis, Parkinson's disease, and the Shy-Drager syndrome.

In contrast to the efficacy of procedures for adductor spasmodic dysphonia, outcomes research with respect to the treatment of nonadductor forms of dystonic dysphonias has rarely been reported. This is primarily because of the general impression by laryngologists that the abductor and mixed varieties of dysphonias have not shown good responses to current therapies. With abductor or mixed dysphonia, the vocal folds open and close normally during inspiration and phonation; in parietic dysphonia, the vocal fold is immobile.

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Endoscopic Forehead Lift

THE FOREHEAD IS the zone of expression. As we mature, the forehead falls, producing a tired or angry look that results from the triad of fallen brows, wrinkles on the forehead and between the eyes, and overhanging infrabrow skin hooding the eyes.

The customary remedy for a fallen forehead has been a coronal forehead lift, with an incision extending from ear to ear across the top of the head. This procedure has the disadvantage of producing paresthesias—resulting from interrupting the course of the supraorbital nerve—causing hair loss in the large incision line and altering the shape of the hairline.

Endoscopic approaches to lift the forehead were developed in 1989. The procedure has been successful whether the surgeon worked in the subgaleal, subperiosteal, or subcutaneous planes.

The success of the ability to elevate a fallen brow, eliminate forehead wrinkles, and relieve infrabrow skin overhang has been equivalent to that of the standard coronal forehead lifts with incisions in front of the hairline, and the stability of the aesthetic corrections appears comparable over a six-year follow-up. The incidence of complications is diminished when compared with that of the standard procedure: the hair-bearing skin is not resected, the incidence of postoperative paresthesias is diminished, the hairline is not altered, and scarring is reduced. Most surgeons have not increased their charges for forehead lifts, despite the expense of added endoscopic instrumentation.

This procedure relies on the principles of releasing the muscles that held the brow downward and advancing the brow and forehead backward. The posterior retraction of the forehead and brow is fixated to periosteum, and excess skin is removed through a triangular removal of skin through the small incision. Subsequently, a technique of backward fixation has been developed using a screw in the skull. This method of fixation has allowed even these small incisions of 4 to 5 cm to be reduced to 1 cm.

At present, an entire forehead lift can be done through three to five 1-cm incisions. The resolution of frown lines, the elevation of the brow, and the removal of skin hooding over the eyes has proved, over our six-year experience with this technique in 450 patients, to be stable and long lasting.

Whereas women seeking cosmetic rejuvenative operations of the forehead and brow have benefited from these smaller incisions, men with partial or complete baldness are able to raise their brow position without a feminization of their features. Men had often been excluded from forehead operations because of the scarring across a bald head and a posterior advancement of the forehead.

The methods of endoscopic surgery learned from these forehead cosmetic operations have been extended and applied to the reconstructive field. Facial fracture reduction is one of the ways that endoscopic facial plastic surgery has advanced.

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