EMERGENCIES IN GENERAL PRACTICE

ACUTE RESPIRATORY OBSTRUCTION

BY

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Acute respiratory obstruction ranks high on the list of emergencies in which prompt action is necessary to avert disaster. Unfortunately, in some cases the emergency arises so suddenly that death ensues before medical aid can be summoned; but in most cases the obstruction is more or less slowly progressive, giving time for preventive measures at all stages of its development.

Obstruction of the Nose, Mouth, and Pharynx

Lesions in the nose very rarely cause severe obstruction. Some years ago, however, a newly born infant was admitted to St. Bartholomew's Hospital in such respiratory distress that it had to be placed in an oxygen tent. A very large polyp in the left anterior nares completely blocked both nasal passages. Removal of this obstruction gave immediate relief to the distress, respiration at once becoming normal, and remaining so.

The mouth and pharynx provide a number of cases. A large foreign body—for example, a bolus of food—may be inhaled in the deep inspiration of pertussis, completely blocking both food and air passages. The foreign body should be hooked out with the index finger; in infants the retching induced by this manoeuvre often proves most effective. During anaesthesia, and in unconscious states following traffic and other accidents, the lower jaw and tongue may fall back, causing an exactly comparable obstruction. The jaw must be held forward and an airway inserted or the tongue drawn out with a tongue clip.

Acute inflammatory conditions which give rise to gross obstructive swelling include retropharyngeal abscess, usually in young children, and, rarely, lingual abscess. If seen early vigorous treatment with penicillin injections, from 100,000 to 500,000 units twice daily, should be begun, and in most cases the condition will abort. If the response is doubtful, one of the other antibiotics should be substituted: 2 g. of chloramphenicol daily in divided doses for adults, with proportionally smaller doses six-hourly for children depending on their weight; for children the palmitate emulsion is preferred, each drachm (3.5 ml.) containing 125 mg. of chloramphenicol. Alternatively, chlortetracycline ("aureomycin") or oxytetracycline ("terramycin") may be used in half the above dosage. If an abscess has already developed it should be incised. No general anaesthetic is advisable, and it is very doubtful if topical cocaine has any real effect. The child should be laid supine on a table with a sandbag under its shoulders and the retropharyngeal abscess incised. The child should then be picked up by the feet so that the released pus runs from its nose and can be aspirated by a sucker.

Quinsy does not, as a rule, cause much respiratory obstruction unless oedema has spread downwards to the glottic opening. This abscess may be evacuated by the classical stab in the soft palate or, better still, by sharp-pointed sinus forceps passed up along the supratonsillar fossa. If a general anaesthetic seems imperative a non-irritant vapour—for example, chloroform—would be indicated, the patient being placed as for tonsil dissection.

Allergic swelling of the mouth and tongue may follow a wasp or bee sting on the back of the tongue; usually when the insect has been accidentally swallowed with a drink. Or it may be a manifestation of recurring attacks of angio-neurotic oedema or of anaphylaxis in serum disease. In a patient sensitive to penicillin it has followed the introduction of a penicillin cone into a tooth socket after dental extraction. In all such cases the swelling may extend to and involve the larynx.

In severe or rapidly progressive cases the intravenous injection of 5 to 15 minims (0.3–0.9 ml.) of 1 in 1,000 adrenaline hydrochloride will usually control the swelling. If not, laryngeal intubation or tracheotomy should be performed without further delay.

Laryngeal Intubation and Tracheotomy

The choice between intubation and tracheotomy depends on several factors: the instruments available; the probable duration of obstruction; the need for suction in the after-treatment; and the experience of the practitioner. Intubation is indicated in cases of temporary obstruction. Tracheotomy should be performed if the obstruction is likely to last longer than 24 hours; another reason for it is that aspiration is easy to apply through the cannula. Tracheotomy is therefore often used in prolonged states of coma following head injuries, and sometimes in bulbar poliomyelitis. In the minds of older practitioners tracheotomy is associated with laryngeal diphtheria. But since the immunization campaign, begun in 1940, this disease has practically disappeared in Britain. Dr. William Gunn, physician in charge of the infectious diseases department of the Royal Free Hospital, in a personal communication confirming this, states that croup also has virtually disappeared, whether occurring idiopathically or associated with other diseases, notably measles. Nowadays, therefore, the young doctor is unlikely to get much experience of tracheotomy, but he should have had much practice in direct laryngoscopy during his anaesthetic clerking.

The important points in direct laryngoscopy are to have the patient's neck flexed at its lower end and extended at its upper end; and to lift the tongue and epiglottis with the blade of the laryngoscope, and not use the instrument as a lever with the upper teeth as fulcrum. Intubation is effected by direct laryngoscopy. The patient is laid flat on a table and the neck flexed forward at its lower end and extended at its upper end. If the mouth cannot be opened because of spasm this may be overcome by the intravenous injection of 50 mg. of suxamethonium chloride. The handle of the laryngoscope is held in the left hand, while the fingers of the right hand retract the upper lip to prevent its being nipped on the teeth. The blade of the laryngoscope is advanced along the dorsum of the tongue in the midline until the tip of the epiglottis is seen; it is then advanced for just over 1 cm. in a child or 2 cm. in an adult. The laryngoscope is then lifted sufficiently to take the whole weight of the patient's head and the glottis comes into view. As soon as he takes a deep breath the glottis opens, and the endotracheal tube, which is held ready in the right hand, is quickly passed between the cords. Care must be taken to lift the blade, never to use it as a lever with the upper teeth as fulcrum.

For the operation of tracheotomy the patient should be supine, a small sandbag under the shoulders, and the head well extended. The table should be tilted, with foot down, and oxygen given through a mask. An assistant should hold the head, neck, and chest in a straight line. In semi-urgent cases the neck may be infiltrated with local analgesic; in urgent ones no analgesic should be used. The thyroid and cricoid cartilages are grasped with the thumb and middle finger of the left hand, and an incision made, exactly in the midline, from the lower border of the thyroid cartilage almost to the suprasternal notch. This is deepened, bleeding points being ignored, until the corrugated anterior surface of the trachea is felt with the left index finger. This is then

opened by a stab through the second and third tracheal rings—dilators are introduced and the cannula is then passed. If time permits it is better to divide the isthmus of the thyroid gland between clamps, and then excise a circular disk from the anterior tracheal wall at that level. Finally, do not suture the wound too close to the tube, or surgical emphysema may result; and on no account open the trachea through the first ring, as this usually causes a permanent stenosis of the larynx. Difficulties are met if the head, neck, and chest are not kept strictly in line, and if a hasty stab in the trachea is allowed to close before dilators are introduced. Then, especially in infants, the tube may be forced into the fascial planes anterior to the trachea, or between the anterior tracheal wall and its mucosal lining. It needs stressing, however, that if penicillin is given in adequate dosage in the early stages of acute throat infections most of these emergencies will be avoided.

Laryngeal Obstruction

The larynx is by far the most frequent site of obstruction. The loose attachment of the lining epithelium to the underlying structures, especially in the aryepiglottic folds and over the arytenoid and corniculate cartilages, favours the rapid development of gross oedema in these situations. In childhood the larynx is relatively small in proportion to body size, the cartilages are more pliable, the mucosa less closely adherent, and its lymphatic drainage more plentiful than in the adult. Thus acute symptoms are much more readily produced in children. A slowly increasing constriction of the glottic aperture is much more readily tolerated than one which is rapidly progressive.

Foreign Bodies

The familiar condition of "food going the wrong way" produces a temporary spasm for which only the time-honoured slap on the back is necessary. A larger foreign body—for example, food inhaled during the inspiratory phase of coughing—may block the glottis completely or cause marked glottal spasm. If a laryngoscope and laryngeal forceps are immediately available the foreign body should at once be removed. If asphyxia threatens it is better to perform an emergency tracheotomy first.

Vomit or blood may enter the larynx during induction of anaesthesia and, especially when thiopentone is being used, set up severe spasm. The anaesthetic should be stopped and the foreign matter sucked out. A muscle relaxant—for example, suxamethonium chloride, 50 mg.—may be given intravenously, thus permitting the passage of a laryngoscope and, through it, an endotracheal tube. Among other foreign bodies must be mentioned the membranes of laryngeal diphtheria and of acute laryngo-tracheo-bronchitis. These may have to be removed by laryngeal forceps, following preliminary tracheotomy.

Swelling of the Laryngeal Walls

Swelling of the laryngeal walls may be due to one of the following:

Local or Adjacent Infection.—In infants an acute laryngitis may produce alarming symptoms, even to the point of needing tracheotomy. Perichondritis may follow trauma or irradiation and may complicate syphilis, tuberculosis, carcinoma, typhoid, diphtheria, and many of the specific fevers of childhood. Treatment should be directed to the primary cause if possible. Complete rest of the patient and larynx, full doses of penicillin or other antibiotic in the primary form, and tracheotomy if signs of serious obstruction develop are the appropriate measures. If an abscess develops in the larynx it should be evacuated through the laryngoscope. In Ludwig's angina full doses of penicillin may suffice to abort the infection, but if in spite of this the condition worsens incision in the midline of the neck and drainage are employed. Tracheotomy may be necessary if asphyxia threatens.

Trauma.—This may be mechanical, as in traffic accidents or following a high tracheotomy or clumsy instrumentation,

or it may take the form of scalds, as in children drinking from the spout of a teapot or hot kettle, or of burns from inhaling flames in petrol fires or from inhaling caustic fumes in industry. In accident cases early tracheotomy is indicated if obstruction is marked and there is a possibility of intra-laryngeal haemorrhage. In the other cases strict rest in bed, administration of oxygen, and sedatives to reduce the cough are usually sufficient. A careful watch must be kept for signs of impending asphyxia, a tracheotomy set being ready for instant use.

Allergy.—This has already been described in connexion with the mouth and pharynx, together with the appropriate treatment.

Oedema Associated with General Disease.—This occurs, for example, in nephritis, cardiac failure, and idiosyncrasy to iodides.

Neoplasms.—Innocent growths causing serious obstruction are rare. Malignant growths are a much commoner cause, but usually only at a late stage, when they would be the responsibility of the laryngologist. Should the general practitioner have to perform tracheotomy he should make it as low as possible in order to be clear of the growth.

Spasm

Spasm of the sphincter or paralysis of the dilators of the glottis may cause laryngeal obstruction. Spasm may be of central or peripheral origin. Possibly the commonest cause is the induction of anaesthesia, especially with ethyl chloride or ether and, as previously mentioned, with thiopentone. The anaesthetic should be stopped, oxygen administered from the anaesthetic machine, and the bag squeezed when the glottis opens. Alternatively the glottis may be watched through a laryngoscope and quickly intubated as soon as it opens.

In infants congenital laryngeal stridor, which is present night and day, and laryngismus stridulus, which may wake the infant from sleep, occasionally occur. The former causes alarm to the parents, but no great dyspnoea; the latter causes momentary but severe dyspnoea and is treated by sitting the child up, slapping its back, making it sneeze, or hooking its tongue forward with a finger. Both conditions disappear in the first few years of life.

In adults spasm may be hysterical, due to local irritation of the recurrent laryngeal nerve, or of central origin, as in tabes and tetanus. During an attack an ampoule of chloroform or amyl nitrite should be crushed by the patient and the vapour inhaled. Otherwise sedatives are given. Bilateral abductor paralysis is usually due to bulbar lesions, but may be due to pressure on, or severe injuries of, both recurrent laryngeal nerves, as after thyroid gland operations. In an established bilateral paralysis phonation is good, and quiet respiration is possible, but on exertion severe dyspnoea may develop. When no recovery can be expected the choice of treatment is either permanent tracheotomy, with the use of a tube having an expiratory valve, or operation permanently to abduct the posterior part of one cord.

In the diagnosis of these various causes of laryngeal obstruction the history and symptoms are important, but only inspection by mirror, or by the direct method in children, will establish it with certainty. In some cases time will not permit of this inspection. Obstruction sufficient to call for immediate operation is shown by recession at the suprasternal notch and epigastrium, stridor, and restlessness. Cyanosis is late, ashen pallor being more usual. Jackson stresses the importance of recognizing the cause of restlessness in obstruction, lest morphine be given in error, with disastrous results.

In all these cases urgent action is required. It is always better to operate before it is strictly necessary than to delay until it is too late.

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