TUMORS OF THE TRACHEA

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The development of the bronchoscope has aided much in the early and accurate diagnosis of tumors of the trachea. Prior to its common use, a tumor of the trachea usually was an incidental finding at necropsy, except for the occasional tumor found by indirect laryngoscopy. Reports of tracheal tumors have become progressively more frequent with improved methods in laryngoscopy and bronchoscopy and with more complete postmortem studies.

In 1929, D'Aunoy and Zoeller[1] presented an exhaustive survey in a report of 351 cases of tumors of the trachea. Culp[2] in a review of all the reported cases over a seven year period from 1929 to June, 1936, found eighty-two new cases of primary tumors, fifty-six of this number being described as carcinomas. Of the total 443 primary tumors reported, 147 or 34 per cent were carcinomas.

Tumors of the trachea usually are classified according to the pathological picture but some prefer to classify them according to their relationship to the tracheal wall, namely, endotracheal, murotracheal, and peritracheal. They may be obstructive or nonobstructive, and may be located in the cervical trachea or in the intrathoracic trachea. The lumen of the trachea is more than ample to supply the required air, for its area of cross-section is more than twice that of the widely open glottis. Therefore, very small growths may not give signs of tracheal obstruction.

Endotracheal tumors obstruct the lumen of the trachea by their bulk, and murotracheal and peritracheal growths obstruct the lumen by crowding the wall inward. Jackson[3] states that a tumor situated in any of the three areas mentioned above may cause one of four types of valvular obstruction: (1) stop-valve obstruction in which air cannot pass in either direction; (2) by-pass valve obstruction in which the air can pass both in and out in diminished quantity; (3) check-valve obstruction permitting the ingress but not the egress of air, producing emphysema of both lungs; and (4) check-valve obstruction permitting air to escape from the lung but preventing ingress, to produce atelectasis. If obstruction is complete, asphyxia occurs promptly.

Another mechanism of obstruction is paralysis of the recurrent nerve. If the involvement is unilateral, no dyspnea will result except on exertion. In most instances there is some phonatory impairment for a time, but occasionally the voice is not affected. One or both vocal cords may be paralyzed by a tracheal tumor which produces no other sign or symptom of its presence. This is especially true when the tumor involves the posterior tracheal wall.

Although almost every conceivable type of tumor has been reported

in the region of the trachea, the most common peritracheal tumor is goiter. The most common endotracheal tumor is papilloma, carcinoma being next most frequent. Other tracheal tumors include adenoma, fibroma, myoma, angioma, hematoma, myxoma, fibrolipoma, fibromyxoma, lymphoma, ecchondrosis, ecchondroma, osteophytoma, osteoma, retention cysts, chrondroma, tophus, dermoid cyst, aberrant thyroid, thymus, gumma and the chronic granulomatous lesions. The most common malignant tumor in the trachea is carcinoma, next in frequency is sarcoma, and least in frequency is endothelioma. Probably because of the greater abundance of glandular structures, tracheal tumors are located more frequently on the posterior wall than on the anterior wall and more frequently on the lower third than the upper third.

The most important early symptom is a wheeze heard at the open mouth. The asthmatoid wheeze, so called by Jackson[4] because of similarity in sound, usually is present for some time before dyspnea, the next important symptom, develops. Nocturnal paroxyms of dyspnea often are caused by the accumulation of secretions around and below the tumor. When the size of the tumor is sufficient to encroach upon the lumen, a wheeze is produced, the dyspnea becomes constant, and the nocturnal paroxysms are more severe. A chronic mucoid productive cough may occur which may be either very mild, or there may be strangling paroxysms relieved only by coughing up the secretion. Hemoptysis frequently is associated with adenoma. Fever from necrosis of the tumor itself or pulmonary suppuration secondary to the tracheal obstruction may be present.

Diagnosis

The symptomatology is not sufficient for a diagnosis, although a history of wheezing and nocturnal attacks of dyspnea should make one suspect a tracheal tumor.

The physical signs in uncomplicated, nonobstructive tracheal tumors are negative, but with the slightest degree of obstruction, they are definite and of great importance. The earliest physical sign of tracheal obstruction is a wheeze heard at the open mouth. Next in importance are signs of by-pass valve obstruction, chiefly harsh breath sounds and later check-valve obstruction, producing atelectasis and emphysema distal to the tumor. There is also retraction of Burns' space and the intercostal muscles on inspiration. When atelectasis or emphysema are present, a tracheal tumor should be placed first among the diagnostic possibilities.

If the roentgen examination of the chest does not reveal small endotracheal tumors, or if the tracheal wall does not stand out clearly with a negative shadow showing the lumen, the outline may be more clearly

visualized by the insufflation of bismuth subcarbonate or the instillation of lipiodol.

The only positive method of establishing the presence of an endotracheal tumor or of compression caused by a peritracheal tumor is by bronchoscopic examination. The type of tumor usually can be determined by bronchoscopic biopsy. The presence and frequently the kind of tracheal tumor above the level of the suprasternal notch can be determined by palpation.

Nocturnal paroxysms of dyspnea from an accumulation of secretions around and below the tumor contribute to the diagnostic difficulties. The most common erroneous diagnosis for a tracheal tumor is asthma. The thymus and thyroid glands frequently have been blamed for obstruction which they were not producing, and heart failure has been blamed for wheezing which did not subside on bed rest and digitalis.

Treatment

Benign endotracheal tumors of limited extent require only bronchoscopic removal, which will be curative except for the multiple papillomas which tend to recur locally and elsewhere in the respiratory tract. These are best treated by superficial removal repeated frequently enough to keep the lumen open. Fibromas and hemangiomas usually are best treated by electrocoagulation, care being taken not to damage the tracheal cartilage. Malignant endotracheal tumors are best treated by roentgen therapy. Peritracheal tumors, when benign, usually can be removed surgically, especially those in the cervical region. Roentgen therapy usually is the treatment of choice in the malignant peritracheal lesions.

Prognosis

Benign tracheal tumors are fatal primarily by producing asphyxia or secondarily by causing suppuration in the lungs. If a benign endotracheal tumor is removed bronchoscopically, the prognosis is good. Recurrence is more common in the cases of papilloma. The prognosis of benign adenoma is good but any recurrence should be treated early.

Summary

The symptoms of a tracheal tumor closely resemble those of asthma: wheezing respiration, nocturnal attacks of dyspnea, and dyspnea on exertion. In the case of tracheal tumor, asphyxia is almost a certainty unless averted.

The dyspnea may be due to recurrent nerve paralysis, endotracheal tumor, or compressive peritracheal tumor. These may be differentiated by direct laryngoscopy and bronchoscopy.

The diagnosis of asthma should be made with great caution, even though the patient has other signs of allergy. If a wheeze can be heard at the open mouth, bronchoscopy will eliminate the possibility of tracheal tumor.

REFERENCES

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