

A CASE OF MULTIPLE PAPILLOMATA OF THE LARYNX
WITH AERIAL METASTASES TO LUNGS *

HENRY B. HITZ, M.D., AND ERNST OESTERLIN, M.D.

(From the Milwaukee Hospital, Milwaukee, Wis.)

Dorothy G., aged 2 years, white, female, was admitted to the Milwaukee Hospital, March 16, 1925, with difficulty in breathing and inability to speak aloud. The history, as obtained from her parents, was that at the age of 1 year she had a dry irritative cough followed by a gradual loss of voice, and since that time has been able only to whisper. For two months prior to her admission to the hospital she had occasionally at night a rather marked dyspnea. The child had been a full-term baby, normally delivered, was breast fed for the first thirteen months, and had previously not been ill. At the time of admission she was well developed and well nourished. There was nothing abnormal in the family history. The father and mother were strong and physically well, as were two other children, one older and one younger.

Examination at the time of admission showed no abnormality in the nose, nasopharynx or throat. The tonsils were small and normal in appearance and there was no perceptible adenoid mass present. The larynx showed what appeared to be multiple papillomata covering the vocal cords and much of the ventricular bands.

On the following day, March 17, under direct laryngoscopy, numerous papillomatous masses were removed from the larynx and sent to the laboratory for sectioning. The pathological diagnosis was benign papilloma.

After a short period of time in the hospital she was discharged, but was readmitted with similar symptoms, Sept. 9, 1925. Examination showed redevelopment of papillomata in the larynx, and they were removed again under direct laryngoscopy. She was discharged with improved breathing and speech, but a few months later, on March 20, 1926, she was readmitted and underwent similar treatment. On this occasion, while still in the suspension apparatus, she was given an application of radium for two and one-half milligram hours, and after a few days discharged.

* Received for publication December 8, 1931.

The patient was readmitted to the hospital on June 7, 1926, and on the 19th, removal of the growth was done again with a similar application of radium. She was retained in the hospital under constant observation, but on August 17 she developed such marked stenosis that a tracheotomy was performed and the tube retained until her subsequent death.

Following the tracheotomy, at several intervals, large masses of papillomatous material were removed from the larynx. However, her physical condition was so improved by the tracheal operation that her father insisted upon taking her home. In spite of instructions that he was to bring her back at stated intervals for the cleaning of her tracheal tube, this was but rarely done.

In March 1927, the last removal of small papillomatous masses from the larynx was done. There seemed to have been a marked reduction in the general tendency to redevelopment. However, the following summer she was brought into the hospital in a dying condition by her father, he having attempted to change the tracheal tube and failing to reinsert it properly. In all, this child was in the suspension apparatus ten times.

An autopsy was performed and the following report of Dr. Oesterlin, describing unusual pathological findings, is here presented.

GROSS FINDINGS

Well developed, normal child, 3 years of age, with a tracheotomy wound and tube *in situ*. After removal of the cannula, a large papillary tumor was found projecting into the wound.

Upon opening the trachea, the whole of the larynx and the upper part of the trachea were found to be filled with cauliflower-like masses, the single elements of which presented a distinct papillary structure varying in size from that of a millet seed to that of a lentil. A few of these masses were larger and attained the size of peas. They were grayish white in color, and of firm consistence.

The larynx was entirely filled with these masses in such a way that no details of its structure could be made out. The epiglottis could hardly be seen and was almost entirely covered with papillary tumors.

The adjacent organs, the esophagus and the large blood vessels, were intact and there was no invasion of the tumor into them. The thyroid gland was small and showed no lesions.

The lower half of the trachea and the large bronchi showed no pathological findings. In the lungs, however, there were many small cavities, varying in size, some as large as hazel nuts. Frequently their connection with the smaller bronchioli could be traced. The walls of these cavities were covered with fine granules about the size of millet seeds. The other organs throughout the body were found to be normal.

MICROSCOPIC FINDINGS

The primary growth from the larynx and trachea (Fig. 1) presents a stalk of connective tissue, rich in hyperemic blood vessels. The epithelial lining of this stalk consists of many layers of squamous stratified epithelial cells without hornification. In the upper layers the cells are large and polyhedral. In the basal layer the cells are columnar and their nuclei stain more intensely with hematoxylin. The cells are regular throughout, without any remarkable difference in size or shape. There are a few polymorphonuclear leukocytes scattered among the epithelial cells. The submucosa is in some areas invaded by lymphocytes. As is usual in papilloma of the larynx there are many mitoses.

The nodules in the lungs (Fig. 2) sometimes form compact masses, but frequently contain central lumina which are either empty or filled with desquamated cells and polymorphonuclear leukocytes.

The tumor cell strands consist of squamous, stratified epithelial cells resembling those found in the larynx. There are large, polyhedral cells which stain lightly with hematoxylin. Columnar cells are frequent; they form not only the basal layers as in the primary growth, but are also to be found everywhere between the polyhedral cells. Mitotic figures are still more frequent than in the tissue from the larynx.

The strands of epithelial cells are in some areas directly adjoining the lung alveoli; in others there is a zone of connective tissue which separates the tumor cells from the walls of the alveoli.

A view of Fig. 3 shows a white space lined by columnar epithelium, which apparently corresponds to the epithelial lining of a bronchiolus. This lumen contains, besides detritus and white blood cells, some squamous stratified epithelial cells of exactly the same structure as were found in the papilloma of the larynx (Fig. 4).

COMMENT

The interpretation of the primary growth is not difficult. There is little doubt that here we were dealing with multiple papillomata of the larynx. The growths were removed from different sites at different times and always showed the same type of growth as can be seen in Fig. 1.

The presence of these tumor masses in the lungs is not as easily understood. At first glance, on the postmortem table, it was thought they might be complicating tuberculosis, but under the microscope they are distinctly seen to be a neoplastic growth (Fig. 2). The question then arises whether or not these nodules in the lungs were metastases from the tumors in the larynx. The age of the patient, and the evidently benign type of growth, seem to speak against metastases. In order to detect and definitely rule out a metastatic dissemination of the tumor through lymph channels, many sections of the peritracheal and peribronchial glands were made without finding metastases in these lymphatic structures.

Another possibility is that the nodules in the lung had an origin analogous to the growth in the larynx, resulting in a condition of multiple papillomata in the bronchioli. In this case it must first be assumed that a metaplasia of the columnar epithelium of the bronchiolus took place into a squamous stratified epithelium, from which this type of tumor only can arise, but no reason was found to substantiate such a change. Furthermore it is difficult to understand why the lower half of the trachea and all of the larger bronchi should have been free and only the smaller bronchioli filled with tumor masses. It is also not easy to trace the connection of each nodule with the bronchiolus; sometimes the tumors were lying free in the lung alveoli.

The interesting findings in Figs. 3 and 4 suggest another interpretation. These slides show plainly how the tumor completely fills a part of the lumen of a bronchiolus. This would suggest the interpretation that all of these tumors in the lung had the same common origin, namely, that the tumor masses growing too rapidly in the larynx were detached and carried into the bronchi by aspiration. They passed the larger bronchi but were caught in the bronchioli, obstructing their lumina. In this way they became implantation metastases and began to grow into the alveoli. In some areas con-

nective tissue had already been formed, apparently as a reaction against the foreign body, such as would result from stray particles of tumor tissue invading the lung.

DISCUSSION

The text-books of pathology mention little or nothing about metastases through the bronchi. Only in the French literature is attention given to this possibility. Ribadeau-Dumas¹ mentions the "greffe bronchique" (bronchial graft) for aspirated particles of a cancer of the esophagus which become grafted in the parenchyma of the lung.

Letulle² describes them as uncommon, but very characteristic. He mentions as primary growths, epitheliomata of the pharynx, larynx and trachea. It is easily understood that pedunculated vegetations in the larynx may at intervals shed some fragments or isolated elements, which are still endowed with karyokinetic activity.

Letulle and Jacquelin³ have described a very interesting case of a collapsed lung in which a primary cancer developed. "From this primary growth neoplastic colonies arose in the normal bronchioli by 'aspiration.'" They were grafted and formed carcinomatous nodules. "Around the bronchus they grew, not only into the interior of the bronchiolus, but especially into the alveoli connected with this bronchiolus. This almost systematic disposition of the peribronchic alveoli by the cancer cells cuts out a circular, almost regular zone." Letulle has coined for this type of metastases the term, "metastases aeriennes" (aerial metastases).

In the case here presented, the tumor was histologically non-malignant, both in the larynx and in the lung. Nevertheless the tumor represented an actively growing, benign neoplasm, from which small fragments frequently became detached. It was possible to find these fragments in the center of a bronchiolus and to trace the origin of the tumor nodules in the alveoli from the invaded bronchioli. In spite of a careful search, no invasion of the lymphatics by tumor cells was observed.

All of these facts give definite evidence of the invasion of the lungs, through the bronchi, by a benign papilloma, primary in the larynx. If this be true, closer attention should be paid to the occurrence of this type of metastasis, with the probability that more cases of this type will be observed.

SUMMARY

The case here described is one of multiple papillomata of the larynx with metastases to the lungs through the bronchi (aerial metastases).

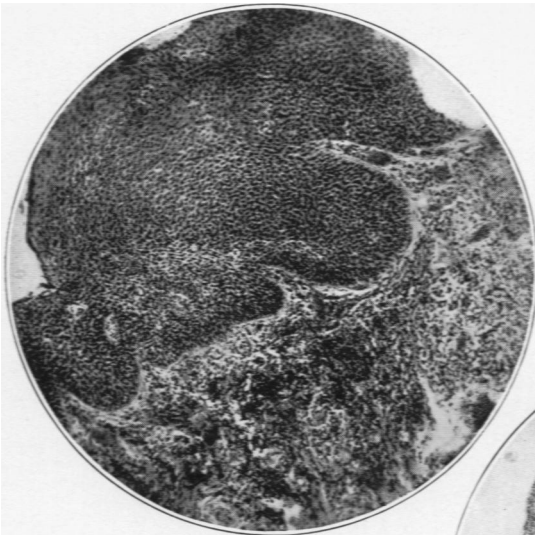
REFERENCES

1. Ribadeau-Dumas, L. *Nouveau traité de Médecine et de Thérapeutique*, II, 599.
 2. Letulle, M. *Anatomie Pathologique*. Masson et Cie, Paris, 1931, 917.
 3. Letulle, M., and Jacquelin A. *Les embolies aériennes cancéreuses*. *Presse méd.*, 1924, No. 84, 825.
-

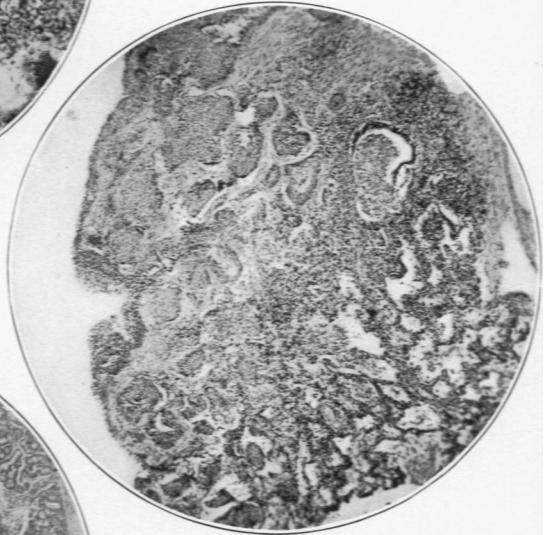
DESCRIPTION OF PLATE

PLATE 59

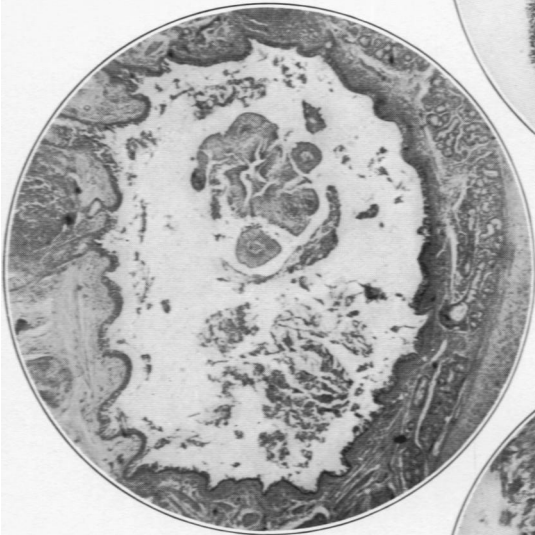
- FIG. 1. Primary growth. Papilloma of larynx.
- FIG. 2. Aerial metastases. Low power.
- FIG. 3. Bronchus showing aspirated tumor mass in its lumen.
- FIG. 4. Central part of lumen (papilloma under high power).



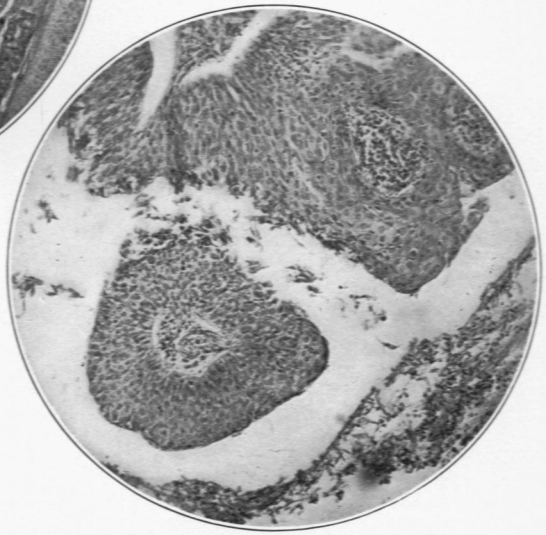
1



2



3



4

Hitz and Oesterlin

Multiple Papillomata of Larynx