FIBROMA OF THE TRACHEA.*

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Fibromata as well as other new growths of the trachea, are not common occurrences. The majority of our American text books of the diseases of the nose and throat make no mention of them. Von Bruns, in his article on the neoplasms of the trachea in Hymann's *Handbuch der Laryngologie und Rhinologie*, states that tumors of the trachea are comparatively rare. He found among his records 300 laryngeal, and only 7 tracheal tumors. His review of the reported cases shows only 102 benign, and 45 malignant neoplasms of the trachea. Schech states in his *Krankheiten der Kehlkopfes u. d. Luftröhre*, that new growths of the trachea may be classified as rare diseases. Moritz Schmidt found among 58,879 nose and throat patients which had come under his observation during 18 years, only 7 new growths in the trachea. Semon found among his classified reports of 10,000 benign laryngeal neoplasms, only one tracheal tumor to every 100 laryngeal. The case which I shall here relate is therefore deemed to be of sufficient interest to report in detail.

Charles B., age 74, a retired police officer, born in Germany, was referred to me on Jan. 6, 1906. He had always enjoyed good health with the one exception, that he had had some trouble with his right eye, which was removed in 1882. (I learned later that this was a sarcoma of the conjunctiva; the enucleation had been performed by Dr. Alt of St. Louis.) Since that time he had always enjoyed good health.

The family history is negative. For the past 5 or 6 months he had been more or less annoyed by an irritative cough, but this had not disturbed him in any degree until about a month ago, when the cough began to annoy him when lying down. He also noticed that there was considerable difficulty in breathing and he would become very short of breath when walking up a flight of stairs. He consulted his family physician, who diagnosed his trouble as a chronic bronchitis. The patient was given small doses of potassium iodide, but his cough became more aggravated, disturbing him greatly at night. The breathing became more difficult, and at times it seemed as though he could scarcely breathe at all. On examination I found him to be well nourished, weighing about 180 pounds.

*Presented as a candidates thesis before the Thirteenth Annual Meeting of the American Laryngological, Rhinological and Otological Society, May 30-June 1, 1907.

He claimed not to have lost any weight. The respirations were distinctly audible, and stertorous in character; his voice was somewhat hoarse. The slightest exertion brought on an attack of dyspnoea. The laryngoscopic examination revealed nothing abnormal in the larynx; but in the trachea a mass could be distinctly seen situated just above the bifurcation on the anterior wall; occupying at least two-thirds of the lumen of the trachea. The surface of the tumor was uneven and appeared somewhat pale. Considering the age of the patient and the appearance of the tumor, I suspected it to be malignant. I observed the patient for a few weeks and made repeated examinations; I also attempted to make a direct examination with the Killian tracheoscope, but found that the patient could not stand this examination. During this time the cough had been getting more severe and the breathing more embarrassed; even the slightest exertion brought on an attack of dyspnoea. The patient found that he could rest more comfortably when lying on the abdomen. I had been seriously considering an attempt at removal of the growth under a general and local anaesthesia, but was deterred from this upon the advice of the internist who saw the case with me. He strongly advised against any operative interference owing to the advanced age of the patient and the presence of a well-marked myocarditis. The dyspnoea became so alarming and the patient was beginning to be very nervous, and insisted on having something done.

He was sent to the hospital and on Feb. 12th a low tracheotomy was performed under primary chloroform anaesthesia. While on the table it was very difficult for the patient to breathe, and the tracheotomy had to be performed very hurriedly. After the trachea had been incised the respirations suddenly ceased and the patient became pulseless, and markedly cyanotic. Knowing that the obstruction was low down in the trachea, I quickly introduced a Killian bronchoscopic tube into the trachea, with the idea of passing the obstruction, so as to allow the air to pass through the tube. As soon as the tube had reached the vicinity of the bifurcation there was a sudden expiratory effort, and a portion of the growth was expelled through the tube; a second mass quickly followed. The patient began to breathe and the cyanosis began to disappear. Heart stimulants were administered and the pulse could be felt at the wrist. After a few minutes the patient's condition was fairly good. I attempted to get a view into the trachea, but owing to the rather profuse hemorrhage this was impossible. I then withdrew the tube

and the hemorrhage gradually ceased. The patient developed a small pneumonic patch in the right lower lobe, which cleared up in about two weeks. There was a marked improvement in the breathing, and there was no dyspnoea; the tracheotomy wound was allowed to close. The patient soon regained his former health.

The method of procedure I had intended to follow was to introduce a Killian tube down to the mass and remove it with a cold snare, which I had had made for the purpose; or failing in this I intended to remove it piecemeal with the biting forceps of Killian. The two masses which were expelled through the tube were about $1\frac{1}{2}$ cm. long by $\frac{1}{2}$ cm. thick. They were cherry red, and had the macroscopic appearance of a papilloma. They were given to the pathologist, Dr. Gradwohl, who reports as follows:

"I beg to report that microscopical examination of the growth removed from the trachea submitted to me by you fails to reveal any signs of malignancy. The growth appears to be a simple polypus covered with normal mucous membrane, and showing a very slight amount of round cell infiltration. Fibrous tissue predominates in it. I made sections from three different places, all showing about the same picture. A slight deposit of hemosiderin was observed in some places."

The patient left the hospital on March 4th. An examination revealed that there was still a mass on the anterior wall of the trachea, occupying nearly one-half of its lumen. The patient claimed that he felt no inconvenience and there was no shortness of breath, even after exertion. A month later I noticed that there was a slight increase in the size of the growth, and it appeared to be extending upward along the anterior wall, but not encroaching on more than half the lumen of the trachea. The general health of the patient is surprisingly good. On December 28, the patient again returned, stating that he had noticed during the last few weeks, after an exposure, that there was considerable difficulty in breathing, especially at night. The examination showed that there had been a considerable increase in the size of the growth, and that the upper portion of the growth seemed to have extended up as far as the 5th or 6th ring, and occupied more than half the lumen of the trachea. An examination of the chest reveals an acute bronchitis. The patient was given a sedative, and when I saw him on Jan. 3, there was a decided improvement both in the cough and the breathing, although there was no noticeable change in the trachea. At the present time the patient weighs nearly 200 pounds.

Von Brun's review of the literature in 1898 shows that up to that time, only 23 cases of fibromata of the trachea have been recorded. Since that time only 6 cases have been added to this list; including the case I have just reported, making 29 in all. I shall review these cases briefly, in the chronological order of their report.

CASE 1. The first fibroma which is also the first new growth of the trachea recorded, is the case reported by Lieutaud, in 1767. The case was that of a boy, in which a polypus with a long pedicle, having its origin in the trachea, had been carried into the glottis by the expiratory air current, causing sudden death.

CASE 2. Stallard reports the case of a man aged 40 years, admitted to the hospital April 25, 1843, in a condition of general weakness, with symptoms of bronchitis. He had been asthmatic a long time. Patient died four days after entering the hospital after a fit of coughing which lasted an hour. Autopsy showed emphysema of the lungs. The bronchioles were healthy, but the right and left divisions of the trachea were congested. In the trachea there was a polypus about the size of an almond.

CASE 3. Reported by Rokitansky. Patient female, age 35 years; mother of two children. Had noticed a change of voice for 4 or 5 years, and finally at intervals lost her voice entirely. In March, 1844, had a spell of suffocation; there was dyspnoea and pain upon making an effort to cough. A polyp was discovered between the cords and another further down in the trachea. A tracheotomy was performed and a canula was inserted; the patient made a good recovery but the voice remained the same. A few months later the patient died of a follicular enteritis. Autopsy showed that the original fibroid had been attached to the trachea just below the larynx.

CASE 4. Smoler reports a case, male, age 22, well nourished. Some years before had had an attack of catarrhal pneumonia during which, hemoptysis with febrile symptoms had occurred. Later on these symptoms were reproduced without any apparent cause. The patient was almost constantly suffering from asthma; an examination of the lungs by percussion revealed a tympanic sound in the right clavicular region. Auscultation revealed some rales; the heart was hypertrophied, the abdominal organs were normal. There was short breathing and palpitation when ascending stairs. Violent fits of coughing, cyanosis, and sweats with purulent expectoration. Patient has a good tenor voice and was able to sing. Parents had died of "lung disease" at advanced age. Autopsy, lungs filled with

reddish brown fluid; no evidence of tuberculosis. Bronchi dilated and filled with fluid. Heart cavities slightly dilated. The finger introduced into the trachea encounters a tumor the size of a large nut, which completely obstructed the organ. It has a broad base and extends from the 1st to the 7th cartilage. Diagnosis: Fibroma of the trachea, confirmed by microscopic examination.

CASE 5. Reported by Fifield. The patient was first seen at her confinement in 1857, then 16 years old and healthy. Father asthmatic. Two years later began to have attacks of asthma, which increased in severity until January, 1860, when well marked symptoms of hysteria developed. The asthmatic paroxysms were remarkably severe. In March of the same year there was severe cough with bloody expectoration. Bronchial rales were heard all over the chest and the case was diagnosed as a tubercular condition. For several months the patient had not been able to lie down, but slept in chairs. On August 20, 1860, she developed measles, after which she remained in better health through the winter and spring. In July, 1861, the patient began to lose ground rapidly. She became very pale, dyspnoea became more marked and the feet and ankles were swollen. Auscultation showed besides the usual rales a well marked "bruit de diable" in the neck. Patient died on July 14, 1861. The autopsy showed, the heart healthy, lungs free from tuberculosis; no emphysema. The right bronchus presented superficial erosions. The smaller divisions were filled with semipurulent mucus. Upon examining the left bronchus the opening could not be found at first. It was perfectly covered by a firm rosy polypus the size of a small grape. The pedicle was attached to the trachea at the mouth of the bronchus, acting as a ball valve, allowing expiration but forbidding inspiration.

CASE 6. Tuerck had observed a patient, age 37, in private practice. There had been little difficulty in breathing. The patient died of pythisis. The autopsy revealed a tumor 6 mm. long, by 2 to 4 mm. thick, situated in the upper part of the trachea attached to the posterior wall. The diagnosis was confirmed by the microscope.

CASE 7. Reported by Gerhardt. Female, age 34. Never had any respiratory difficulty. In November, 1864, the patient died of acute yellow atrophy of the liver. At the autopsy there was found situated above the bifurcation at the level of the 8th ring somewhat to the left, a small polyp $\frac{1}{4}$ cm. wide; by 1 cm. long.

CASE 8. Also reported by Gerhardt. A girl aged 25 was first observed in 1853. The first symptoms noticed were a shortness of

breath, which gradually increased; followed two weeks later by a cough. In the middle of October her breathing was much embarrassed. She was compelled to go to bed; keeping the upper part of her body elevated. She complained of pain in the breast and right side of the neck. The voice was deep and hoarse. A laryngoscopic examination in March revealed a reddish tumor in the trachea near the 6th ring on the left side, only a small space was left for respiration. On March 29 a sound was passed. The breathing became more labored and the cough aggravated. On March 31, the dyspnoea increased, with cyanosis and bloody expectoration. Her condition grew worse and she finally died April 5th. The autopsy showed an acute bronchitis, emphysema of the lungs and some oedema. The tumor was 3 cm. long, by $1\frac{1}{2}$ cm. wide; the pedicle was 2 cm. in length.

Mackenzie reports the following four cases of tracheal fibromata:

CASE 9. Male, aged 41, entered hospital in March, 1865, with hoarseness and slight dyspnoea. The larynx was found congested, and was treated with astringents. On October 16th a growth was seen about the size of a bean, occupying the 2nd and 3rd ring of the trachea. In November several unsuccessful attempts to remove it with a forceps were made, but on December 21, 1865, the growth was touched with electric cautery; one week later no sign of it could be seen.

CASE 10. Female, age 10. First applied at hospital suffering from dyspnoea and weakness of voice. A growth about the size of a pea was seen on the 3rd ring of the trachea, rather to the left side of the median line. On attempting to remove the growth with the cautery, the patient moved and both cords were injured. The patient did not return for further treatment.

CASE 11. Age 37, was seen in March, 1874. He was suffering from dyspnoea and hoarseness. A growth was seen just above the anterior commissure, which was removed with the forceps; a growth about the size of a currant was then seen occupying the 1st and 2nd ring of the trachea. The cricoid cartilage could be distinctly seen above it. After two failures the polyp was touched with the galvano-cautery; a week later no sign of it was seen.

CASE 12. Male, aged 45, applied at the hospital on June 15, 1876, suffering from dyspnoea. A smooth red polyp about the size of a grape was seen covering the 4th, 5th and 6th rings of the trachea. A tracheotomy was proposed but refused. The patient died three months later of apoplexy. No post mortem.

CASE 13. Man, age 63, was first seen by Ingals in 1881, with symptoms of laryngitis. In February, 1883, the author discovered a growth in the trachea 4 to 5 cm. below the larynx. It was sessile and flattened in form, standing out from the surface of the trachea about 5 mm. and occupying an area ranging from 8 to 12 mm. in its various diameters. It was of a reddish color and granular. There was no inconvenience in breathing and no noticeable size of the tumor when seen six months later. There was no attempt at removal.

CASE 14. Reported by Stoerk. This case was that of a midwife 40 years of age, who had difficulty in breathing. A laryngeal examination revealed a fibroma the size of a bean in the upper part of the trachea. The patient refused a tracheotomy, so was allowed to go without further treatment.

CASE 15. This case, reported by Masini, has been considered a typical one. It was a fibro-myxoma situated upon the 1st ring of the trachea and on phonation could be seen below the cords. It was extirpated through the mouth with a modified Mackenzie's forceps under cocaine anaesthesia.

CASE 16. Lewin presented a patient who had been wearing a tracheotomy tube for 24 years. The patient had always been perspiring, coughing and subject to fits of suffocation. The laryngoscopic examination revealed a redness and swelling of the vocal cords and a fibroid tumor which grew out from the posterior wall of the trachea. After the tracheotomy the patient showed great improvement, could speak well and breathe well. Further operation was refused by the patient.

CASE 17. Langlet mentions a case of a man, age 60, who was seen in 1886 with marked symptoms of obstruction, cough and pain on swallowing. He also complained of a feeling of foreign body. The voice was hoarse. Auscultation revealed generalized mucous rales. No abnormal signs were detected by percussion. The patient was given jaborandi in two gram doses, which seemed to relieve him for a time. A laryngoscopic examination showed no foreign body nor tumor of the vocal cord. The patient began to have severe attacks of suffocation and succumbed July 14, 1886. The autopsy showed a small white lobulated tumor the size of a small nut 3 cm. above the bifurcation of the bronchus. A part of this tumor had become detached and fixed itself in the larynx, causing a rapid asphyxia.

CASE 18. Braun reports a case, male, age 40, sent to the author in February, 1889, by Dr. Escher with a diagnosis of tracheal

polypus complicated with laryngeal troubles. The history showed that the patient had been hoarse for ten years without any other noteworthy symptoms. He began to have a feeling of pressure in the throat, constant coughing and dyspnoea when lying down or sleeping. The hereditary history of the patient was negative. Inspection showed a short thick neck "and highly arched tongue." The opening of the larynx was narrow, the breathing was labored. Upon deep inspiration it was possible to see a thick white tumor 1 cm. below the anterior commissure, which moved backwards and forwards. It was found that a 20 per cent solution of cocaine not only would not anaesthetize the growth but produce hyperaesthesia. Five weeks later the author removed the growth with a forceps. The patient made an uneventful recovery and there was no recurrence.

CASE 19. Reported by Oazmann, in which a polypus of the larynx and of the trachea was extirpated at one time. This was followed by a recurrence. Laryngotomy and cauterization were next done; this was also followed by a recurrence. The removal was then made through the mouth and the patient given potassium iodide internally. No recurrence after five years. The age not stated.

CASE 20. Bidwell showed to the Pathological Society of London a specimen of a fibroid polypus of the trachea. It was taken from a boy five years of age who died from asphyxia at the Evelina Hospital for Children. The polypus was the size of a small marble and was attached to the posterior wall of the trachea by a distinct pedicle. On microscopic examination the growth was found to consist of fibrous and cellular elements without any distinct evidence of sarcoma, except that some of the nuclei appeared to be becoming spindle shaped. There was no sign of disease in any other organ; the child had suffered from symptoms for fourteen days and tracheotomy had been performed without relief two days before death. This was the first case of fibroid polypus of the trachea shown to the Society.

CASE 21. Avellis reports a case, male, 50 years of age, who had been suffering for a long time with a large struma and marked difficulty in breathing. The author was called because the patient had coughed up some blood. Pharynx and nose hyperemic. The left vocal cord was paralyzed and fixed. The larynx was markedly scoliotic, and the trachea involved lower down. The author discovered a body which moved upon breathing but an accurate

examination could not be made. The source of the hemorrhage was not discovered. A few days later the patient developed symptoms of pneumonia. The autopsy showed that the left vocal cord was somewhat atropic and fibrous. Near the 7th and 8th tracheal ring the polypus was seen; it was like the whole of the tracheal mucosa, somewhat red, not bleeding and could be moved easily by the sound. Later examination revealed a beginning sarcoma.

CASE 22. Krieg in his *Atlas der Kehlkopfkrankheiten* gives an illustration in which a fibroma situated just above the bifurcation on the posterior wall of the trachea almost obstructs the entire lumen. I was unable to find anything further regarding the case.

CASE 23. Schmidt in speaking of fibroma of the trachea in his *Krankheiten der obern Luftwege* refers to Tuerk's and Stoerk's cases, and then states that Boeckenhheimer had seen a lympho-fibroma in the trachea which was operated upon with good results.

CASE 24. Eppinger reports the case of a man aged 23 who had died suddenly; a round tumor as large as a hazel nut was found on the posterior wall of the trachea 4 to 5 cm above the bifurcation. The diagnosis was verified by the microscope.

CASE 25. Jurasz reported a case of a male, age 38 years, who had been suffering from hoarseness of a slight degree for more than a year, but which in the last two months had become troublesome. The breathing was somewhat impaired. On laryngoscopic examination a polypus the size of a small hazel nut could be seen which had its origin in the trachea. The growth moved with each inspiration and expiration. No attempt at removal had been made.

CASE 26. Rosenfeld mentions a case in which a polyp the size of a pea, had its origin on the anterior wall of the left bronchus, and after an attack of coughing could be seen lying over the bifurcation.

CASE 27. Ogle reports a case of a child one and one-half years of age, admitted to the hospital apparently in good health, who was readmitted the same day with dyspnoea. The mother said the patient had several "spells of short breathing" on the way home. A second tracheotomy was done and the patient died. A tumor was found attached by a pedicle at the site of the first tracheotomy. The author believes that the asphyxia might have been due to a cold after leaving the hospital; or it might have been due to a spasm. The tumor seems to have been a fibroma.

CASE 28. Marcel and Zigura report a case of fibroma of the trachea in a patient aged 33. The tumor was the size of a hazel nut.

It was removed and no recurrence followed. The tumor was examined by Babes, and pronounced "a typical fibroma."

An analysis of the reported cases shows that fibromata may be found at all ages. One patient was below 2 years; three patients between 5 and 15; three between 20 and 30; seven between 30 and 40; three between 40 and 50; two between 60 and 70, and one over 70; in eight the age was not stated. The sexes are about equally divided. Eleven of the cases were males, and seven females, and in ten the sex was not recorded.

The size of the growths varies from that of a small pea to that of a large nut. In the case of Smoler, the growth completely obstructed the trachea. The location of the tumors was also a variable one, as they were found in all parts of the trachea. In one of Mackenzie's cases the growth was attached to the first ring of the trachea. In Rosenfeld's case the origin of the growth was in the left bronchus.

The symptoms varied from a slight hoarseness, weakness of voice, cough, dyspnoea, asthmatic symptoms, attacks of suffocation and asphyxia, ending in death. In nine of these cases death had occurred from suffocation. The amount of disturbance depends on the size and location of the growth. In Langlet's case there was a feeling of foreign body which the patient attempted to cough up; this cough was followed by spells of suffocation. In Rokitansky's case there was pain in the chest on coughing. In Smoler's case there were symptoms of catarrhal pneumonia without fever; these attacks were brought on without any apparent cause. In Braun's case there was hoarseness for ten years without any other symptoms. Fifield's case showed marked asthmatic symptoms for more than three years and the case was believed to be tuberculosis. In Ingal's case, a growth situated 5 cm. below the larynx and extending 5 mm. out from the surface of the trachea and occupying an area varying from 8 to 12 mm. in its various diameters, produced no symptoms. In four cases reported by Mackenzie the growths varied in size from a small pea to a grape. In all the cases there was a noticeable dyspnoea with hoarseness.

A positive clinical diagnosis was made in sixteen of these cases; the others were diagnosed on the post mortem table. Five of the cases were recorded before the discovery of the laryngoscope; these were diagnosed at the autopsy. Tuerck was the first to see a tracheal growth in the laryngeal mirror. With the further development of the direct methods of examination more of these cases will be recorded.

A histological examination was made in only nine of the cases. In Ogle's case the growth had its origin at the site of the tracheotomy wound, and as a histological examination was not made this case was in all likelihood a granulation tumor, and not a true new growth. In the case of Avellis a beginning sarcoma was discovered later. In Bidwell's case some of the nuclei appeared to be becoming spindle shaped. This seems to bear out the statement of Proebsting that no conclusions should be drawn from a macroscopic appearance of these tracheal growths. He reports a case in which a polyp with a small pedicle had been coughed up and brought to him by the patient. Proebsting could distinctly see the remaining portion of the pedicle in the trachea. The macroscopic appearance was that of a typical mucous polyp; a microscopic examination, however, revealed carcinomatous elements in the interior of the polyp. The patient died nine months later of carcinoma of the trachea and left lung. In the case reported above by me, sections were made by four different pathologists, and no evidence of malignancy was found in any of the slides examined.

Attempts at removal were made in only six of the cases. In Braun's and Massini's cases the growths were removed through the mouth by forceps; they were situated high up in the trachea. In Oazmann's case the growth was first removed with the forceps through the mouth. A recurrence followed. A thyrotomy was done followed by a second recurrence. A third removal was made through the mouth and proved to be successful. In two of Mackenzie's cases the growths were destroyed by the galvano-cautery. In one case reported by Mackenzie the vocal cords were injured in attempting to cauterize the growth; further attempts were then refused. In Lewin's and Ogle's cases a tracheotomy was done, but no attempts at removal were made. In Gerhardt's case a sound was introduced into the trachea; death followed several days later. In my own case a partial removal was done with relief for eleven months. The patient is still quite comfortable.

Regarding the prognosis of these tumors, the cases of Proebsting and Avellis should again be borne in mind, and a careful microscopic examination should not be neglected, even when the macroscopic appearances are typical. A great advance in the operative technic of these cases has been made through the development of tracheoscopy and bronchoscopy, as done by Killian and others. With the aid of these the removal of the growths situated low down in the trachea or even in the bronchi themselves is no longer an impossibility.

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