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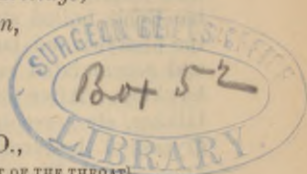
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## CASE OF INTRA-LARYNGEAL TUMOUR

(Showing under the microscope mixed characters, principally, however, those of small-cell sarcoma)—in a Syphilitic Subject. Partial Evulsion, Perichondritis, Abscess pointing exteriorly, Fistula of Larynx, Necrosis of Thyroid Cartilage; Tracheotomy; Death; Examination, Post-mortem; Remarks.<sup>1</sup>

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MICHAEL S., æt. 32, born in Ireland, farmer, 14 years in the United States. When in the United States Army, in 1864, contracted hard chancre. Patient had anti-syphilitic treatment for several weeks after primary lesion was recognized. Since that time rare constitutional symptoms of mild type have manifested themselves.

By careful examination of patient's present condition we have been able to detect but two physical signs of the existence of constitutional syphilis, viz., 1. slight alopecia, 2. a number of enlarged indurated lymphatic ganglia, in different regions of the body. There are no traces of present or ancient syphilitic affection of the integument of the face, trunk, or limbs. As much may be said of the mucous lining of the buccal cavity. Constantly recurring nocturnal pains of osteoscopic character are complained of, and appear to indicate *functional* trouble of specific nature, inasmuch as no tumefaction of bone or periosteum can be detected.

Three years ago patient caught a severe cold, and during five months from above period, has had at times incomplete aphonia. Later, and till a few days before Christmas, 1873, voice remained permanently feeble, and there were few if any intervals when it notably improved. During the latter days of December, 1873, pain localized over region of larynx became a prominent symptom. This has increased somewhat in the past few weeks, and now (May 1st, 1874) is always present. It is made still worse by an attempt to swallow, or a paroxysm of cough. For two or three weeks deglutition has been imperfectly accomplished. Solid substances pass into the stomach with difficulty, and occasionally particles of food get into the larynx, cause cough, and are expectorated for several minutes after a wearisome and insufficient meal is terminated. Liquids are swallowed only after repeated trials, and it is not infrequent to see them

<sup>1</sup> The history of this case, with the accompanying marked specimen of intra-laryngeal growth, was presented to the New York Pathological Society, at a stated meeting, held June 24th, 1874.

rejected in great part through the mouth and nose. The œsophagus is apparently free from disease, and the difficulty of swallowing is due either to the pain which this act occasions, or to loss of healthy function of the epiglottis and pharyngeal muscles, and not to organic obstruction in the passage way of the alimentary bolus. Patient is pale and thin, and has been losing strength daily for about one month. There is, however, no family history which would lead one to suspect tubercular deposit in the lungs, and the signs given by percussion and auscultation of these organs remain wholly negative. The vesicular murmur is partially obscured, it is true, but this is owing to exaggerated sound transmitted from, and which takes origin in, the vocal organ. There is abundant expectoration of white, frothy mucus, and at times the *sputa* are viscous, non-aërated, and resemble thick boiled starch. These latter appear to come principally from the pharynx and larynx, as few râles can be heard in the bronchial tubes, and accumulated mucosities are brought into the mouth by an effort of hawking. After slight physical exertion of almost any kind (walking, talking, etc.), respiration becomes noisy, and in a measure difficult, and dryness of the throat is on these occasions a symptom which causes much annoyance. The voice and cough are now broken, husky, and imperfect, and have lost much of their normal strength and pitch. In a word, our patient is incompletely aphonic.

*Larynx.*—The interior of this organ offers a diseased appearance in its entire area. This aspect, as shown with the laryngeal mirror, is, as nearly as possible, expressed by the term *fungoid*. First, and most prominently, there is a large, pinkish, mammillated growth situated on the right side of the larynx.<sup>1</sup> This growth fills up about two-thirds of the superior opening of the larynx, and has a broad base attached to the greater portion of the right ventricular band. It extends as far forward as the anterior commissure, but leaves a small orifice behind its margin and the posterior commissure. The size of the growth is about that of a very small hazel nut, and conceals from view in great part the right vocal cord. The mucous membrane covering the arytenoid cartilages is red and swollen, and the submucous tissue infiltrated. Upon the superior surface of the right arytenoid cartilage is a single ulceration. Below the left vocal cord is a second neoplasm as large as a lentil, irregular in outline, and apparently of similar structure to the one first described.

It springs from the left side of the cricoid ring. The vocal cord and ventricular band on the left side, have a pinkish coloration, and in their entire extent a mammillated appearance, with numerous points where evident ulcerations are situated.

What was the vocal cord and ventricular band on this side, viz., the left, is now covered with, or included in, morbid tissue. The posterior commissure is very much thickened.

Such was the condition presented by the interior of the larynx during the ordinary movements of inspiration and expiration. During an effort of phonation the first and larger growth obstructs the lumen of the larynx completely and presents the approximation of the vocal cords, or, more properly speaking, the layer of morbid tissue in which these fibrous bands are comprised. Both arytenoid cartilages rotate partially, and so far as

<sup>1</sup> The exact point of origin of the neoplasm could not at first be determined, but in later examinations it was seen to arise from the right ventricular band. The necropsy confirmed the accuracy of this diagnosis.

they are doubtless able to do, having in view the mechanical obstruction due to the presence of a tumour on the right ventricular band, and having also the thickened condition of the index-arytenoid commissure. The crico-arytenoid articulations are not, therefore, if we consider the evidence furnished by the laryngeal mirror, in a diseased condition.

*Treatment.*—Inhalation tinct. benzoini comp. (3j-3j) several times in twenty-four hours. As nourishment a thick mixture of essence of beef, yolk of eggs, and oatmeal porridge.

*May 5.* Patient admitted into the Manhattan Eye and Ear Hospital. On this and following days, several partially successful attempts were made by my friend and colleague, Dr. Andrew H. Smith, and by myself, to tear away the larger of the two growths in the larynx. Bits of the growth were brought away by one of us on these occasions by means of Mackenzie's antero-posterior cutting forceps. The successive operations were well supported, caused but moderate pain and little or no hemorrhage subsequent to the evulsion. Anti-syphilitic treatment was employed, viz., frictions over region of larynx with unguent. hydrarg. and administration of potass. iodidi externally. Applications of cupric sulph. (gr. xv-3j) and insufflations of iodoform were made more than once, and apparently with some good effect, to the interior of the larynx.

*12th.* Has evidently improved; deglutition is more easily performed and without being followed, as a few days since, by regurgitation through the mouth or nasal passage. The breathing, which previously became noisy after the slightest exertion, is now more tranquil under similar conditions. The voice is somewhat stronger; localized pain has not diminished, and on examination of the region of the larynx, considerable redness and tumefaction are seen, which we ascribe to irritation caused by the mercurial frictions. These latter were stopped, and poultices ordered to be applied and frequently renewed; the size of larger growth has considerably diminished, and at present more than one-third its original volume; the pulse continues weak and accelerated; the thermometer in the axilla was found to mark 100°.2 Fah. (May 5th), and has varied but little since.

*23d.* Patient having failed to show himself at hospital, he was visited to-day at his house by Dr. A. H. Smith and self, and found ill in bed; he is very weak and much emaciated; has suffered from diarrhœa, which happily is now arrested; for seven days he has been able to take very little nourishment, owing to extreme soreness over laryngeal region; during afternoon he was again transported to Manhattan Hospital in a carriage; on his arrival there attempts were made to examine the larynx; on account of great intolerance of mirror the inspection of the vocal organ was imperfect; yet it was evident that the upper orifice of the larynx was still considerably obstructed by what remains of the growths already described, by neighbouring thickening of mucous membrane and by submucous infiltration; discharge of muco-purulent character lines the interior surface of the larynx.

Externally, an abscess of considerable volume was immediately recognized. It was situated over region of thyroid cartilage, and pointed somewhat towards median line. When opened by a vertical incision one-half inch in length, two or three teaspoonfuls of fetid sanious pus came out, or were pressed from the interior of the pyogenic cavity. Mingled with the pus were several air globules. The existence of these latter was explained by the decomposition of pus, which doubtless had its origin in the perichondrium covering the thyroid cartilage.

With the probe considerable burrowing on the left side of the neck (two inches) was made apparent. On the right side there was less separation of the skin from the soft parts beneath; no necrosed points of cartilage were discovered after a tolerably thorough examination; a strip of lint was introduced by the external opening of the wound, and instructions were given that the cavity should be washed during the evening with carbolic lotion. The incision of abscess relieved patient of much pain. Beef-tea, milk, egg, brandy, were prescribed in such quantities as patient might wish to partake of them.

24th. Breathing is frequent and noisy, but without great difficulty or oppression; passed a restless night; with probe necrosis of thyroid cartilage in neighbourhood of anterior insertion of vocal cords is discovered, and after some search a point where there is a small orifice communicating with the interior of the larynx; introduction of probe by this orifice occasions a paroxysm of painful cough. When patient closes his mouth and nose he can blow air from lungs through the fistulous opening; skin is still hot; pulse 108; less fever, however, than yesterday; moderate discharge of fetid pus from wound; diminished soreness on pressure; skin has adhered in part on both sides of wound to soft tissues beneath; cough very troublesome; expectoration at times of muco-purulent sputa, tolerably tenacious, and again of a white, frothy liquid; less viscous and adherent. There is but little blood mingled with sputa; milk taken was vomited as a heavy, solid coagulum. Ordered liq. morph. sulph. ℥j at bedtime, to be repeated if necessary. Mist. expect. (ipecac, acacia, etc.) ℥j occasionally when the cough is troublesome; liquor calcis mixed with milk (℥ss-℥iv), jelly, port-wine, egg, milk, beef-tea, etc.

26th. Temperature 101°.2 Fah.; pulse 112; expectoration easier; passed a good night; taken a tolerable amount of food; fistula patulous, as yesterday. When patient coughs, air passes freely by orifice. Ordered suppositoria c. quinae sulph. gr. iij three times a day.

27th. Pulse 108; weaker; coughs continually; abundant viscid expectoration; has taken very little nourishment; great thirst; one motion of bowels; cold, clammy, and very excessive perspiration.

31st. During the evening the patient was suddenly attacked with intense dyspnoea. Dr. A. H. Smith, who was immediately sent for (as I was absent from the city), found patient breathing with less difficulty than he had done a short time previously. Deeming it prudent, however, to prevent a possible recurrence of dyspnoea, and the hour (11 o'clock P. M.) being unfavourable for a major operation, he enlarged the wound somewhat, and excised a small portion of the left thyroid ala, where it was necrosed. Patient breathed more easily after the operation, and passed the night with relative comfort.

June 1. About mid-day patient took ether. So long was he in being sensibly influenced by it, that a moderate proportion of chloroform was used so as to produce complete anæsthesia. The operation of tracheotomy was then successfully performed by me, aided by Dr. Smith. No large vessel was divided. There was, however, moderate hemorrhage after the introduction of the canula.

2d. Doing about as well as could be expected yesterday afternoon; the expectoration alone, by its abundance, giving legitimate cause for immediate anxiety. He passed a restless, feverish night, and enjoyed little or no sleep. No nutriment was taken, so great was the pain occasioned by the effort of deglutition. This morning at 5 o'clock A.M. the canula

became stopped up with viscid phlegm, and patient was nearly choked to death before efficient aid could be given by the nurse in attendance. The canula caused much pain, and liquids, when swallowed, pass into the larynx and trachea in part, and are thrown back after cough or violent expiration through the wound and tracheal tube. Pulse is irregular and very feeble; respiration very frequent. Since early morning has taken but a small quantity of beef-tea and milk.

3d. Yesterday in the afternoon a consultation was held with Dr. A. H. Smith, and it was determined that the operation of thyrotomy should be performed, and that after complete separation of the *alæ* of the thyroid, the interior of the larynx should be rid, so far as possible, of the morbid growths contained therein; that explorations should be made to find out the exact situation and limits of the processes of necrosis, and that whatever portions of dead cartilage were to be got at, without increasing the already very serious condition of the patient, should be removed, and that afterwards, supposing no incidental circumstances were to arise and counter-indicate such treatment, the canula should be withdrawn, and the implicated parts brought together by means of stitches. Such was the plan of procedure adopted after much reflection, and it was, in reality, the only one left us if we were not prepared to stand by quietly, and see death follow surely and promptly.

Unfortunately the impressibility or weakness of the patient was such that we found ourselves obliged to forego carrying out the above indications.

On two successive occasions, all proper precautions being exercised, an attempt was made to bring the patient under the influence of chloroform. Inasmuch, however, as alarming symptoms manifested themselves after but a few inspirations, the inhalation was considered too hazardous to be continued. The idea of any further operative measures was then definitely abandoned, and it was believed that, if persisted in, they would cause an immediately fatal result to the patient.

The pulse and respiration increased in frequency during the afternoon and evening, the patient taking little or no nourishment of any kind. His strength failed him more and more, and, sinking gradually, he died at 11½ o'clock P. M. (June 2d), the proximate cause of death being the clogging up of the smaller bronchial tubes by an excessive amount of muco-purulent secretion.

*Necropsy* (June 3d), fifteen hours after death, was confined to the larynx, as circumstances did not admit of further examination. Upon dissection of soft tissues, so as to separate the larynx from the adjacent parts, and take it out completely from the cadaver, no burrowing to any extent in cellular tissue under the skin was remarked, and apparently the cavity of the abscess, opened into some days previously, had become almost if not entirely obliterated. After separating the intrinsic muscles of the larynx in front from the *alæ* of the thyroid cartilage, a considerable part of the right *ala*, in the neighbourhood of its lower margin, was found to be without perichondrium; bare and rough to the extremity of the probe. In fact, there was evidently a condition of necrosed cartilage at this level. On the right side the soft tissues presented a greenish aspect, due to putrefactive changes. In this direction, also, there was distinct proof of fistulous burrowing previous to death. The left *ala* was less diseased *in front* than the right, and no portion of this region was bare, or showed detached perichondrium. The fistulous orifice communi-

cating with the interior of the larynx, which had spontaneously shown itself before death (after incision of the abscess mentioned in the history of the case), and which had been enlarged by Dr. Smith, was situated just on a level with the anterior attachment of the vocal cords and ventricular bands. The larynx having been laid open from behind on the median line, a good view was obtained of its interior. The following is an accurate description of its appearance: The free border of the epiglottis was but little affected. It was free from ulceration, and only very slightly thickened. Considering the age of the patient (thirty-two years), the yellow coloration of the fibro-cartilage was more apparent than usual. The base of the epiglottis—and, in fact, the general aspect of the larynx when looked into from above—to be expressed by a term which nearly approaches accuracy, is *fungoid*. So true is this word to the idea in the mind, that the question immediately suggests itself, have we not here a malignant growth of carcinomatous structure? To particularize—the inferior two-thirds of the epiglottis, the ary-arytenoid folds, the posterior commissure, and the mucous covering of the arytenoid cartilages, are all much thickened, and offer a very light pinkish coloration. At the base of the epiglottis, to the right, is a round, somewhat mammillated growth about the size of a large pea, adherent to the mucous membrane by a broad base, of almost equal diameter to the prominent portion of the growth. The rest of the posterior surface of the epiglottis which we are considering, viz., the inferior two-thirds, presented mammillary elevations due to smaller pathological formations of same nature with the preceding, alternated with depressions occasioned by ulcerations of lenticular configurations. One of these presented a yellow fundus, which was none other evidently than the fibro-cartilage of the epiglottis. The ary-arytenoid folds and mucous membrane lining the arytenoid cartilages presented several points of ulceration.

One of these ulcerations, isolated and very distinct in outline, is situated on the superior aspect of the mucous membrane covering the right arytenoid cartilage. Lower down, what remains of the growth spoken of in the history of the case, is distinctly seen to take its origin in the right ventricular band, and to cover over and conceal from view almost entirely the right vocal cord.<sup>1</sup> The left ventricular band and left vocal cord are very indistinct in their outline and barely distinguishable, on account of infiltration of their mucous lining, with deposit of similar structure to what forms the neoplasms described. The lumen of the larynx is diminished, but not sufficiently to account by itself for the intense dyspnoea which came on suddenly, during the evening when Dr. Smith enlarged the fistula of the larynx.<sup>2</sup>

At the posterior wall of the larynx, and on either side, is a fistulous passage which extends for some distance amongst the soft tissues which laterally are in relation with the cricoid cartilage. This cartilage is much diseased in the superior half of its posterior wall.

Upon section this portion presents a dark-brown coloration of the cancellated portion of what has evidently become transformed into osseous

<sup>1</sup> Before evulsion was commenced, this growth extended below the right vocal cord.

<sup>2</sup> This dyspnoea is doubtless sufficiently explained by sudden spasm of the adductor muscles, or else by sudden obstruction of the calibre of the larynx, with viscid and purulent secretion, coming from the bronchial tubes.

structure. From this portion of diseased cartilage the fistulous orifices and tracts mentioned, take origin. The lower half of the cricoid cartilage appears healthy.<sup>1</sup> Below the inferior border of the cricoid cartilage the tracheal wound is visible in the median line. The mucous membrane at one point to the right and behind—on a level with the inner extremity of the canula—is ulcerated, and offers evident marks of inflammatory processes in the immediate neighbourhood. Elsewhere the mucous membrane of trachea shows numerous congested spots. One or two of the tracheal rings, especially on the left side, for about one or two lines, are broken and bent backward into the tracheal passage and the wound of the trachea, though on the median line and made with a single incision of the bistoury, is irregular on its margin—as if notched, and a portion of the tracheal rings had been removed, by two or more incisions, made in different directions.<sup>2</sup>

*Note.*<sup>3</sup>—Appended to this microscopic examination, are the characters discovered with the microscope, and which have been given me by CHARLES S. BULL, M.D., Pathologist to the Manhattan Eye and Ear Hospital.

“The growth is mostly of a fibro-cellular structure with the cells largely predominating—in fact there seems just enough of fibrous connective tissue present to hold it together except towards what looks like the base of the tumour, where it is somewhat more abundant. Only in isolated spots on section did I meet with any epithelial cells covering the surface. The mass of the growth is composed of small, round, nucleated cells, with granular contents, about size of a pus corpuscle. There were some few fusiform, or caudate cells scattered through the tumour, and near the base they were quite numerous, being arranged together as we see them in a true fibro-cellular growth. There were some larger ovoid cells, few in number, about twice or three times the size of the round cells, with nucleus and nucleolus. The numerous bloodvessels proved the growth to have been somewhat vascular. I could not find any remains of glandular tissue, and though the tumour resembles very closely a lympho-sarcoma, yet there were spots, or vacuoles, which we meet with in the papillomata, which were filled with a homogeneous mucous matter, giving the appearance of a myxo-sarcoma. The centre of each piece of the tumour was much softer than the outside.”

“To sum up the examination, I should call the growth a small-cell sarcoma, towards the base being of the fibro-cellular variety, while the rest of the growth is of a myxo-sarcomatous character.”

Subsequently a communication was received from Dr. Bull, as follows:—

<sup>1</sup> The point of origin of disease of cartilage, as perichondrium is not evident. Did chondritis, as perichondritis develop itself first in thyroid, or cricoid cartilage? Impossible to affirm positively from ocular examination.

<sup>2</sup> We would draw attention to the fact, that the smaller growth situated under the left vocal cord, of which we speak in the history of our case, is not mentioned in the microscopic description, as made after death, and with the morbid specimen before our eyes. This smaller growth is no longer visible. What has become of it, we cannot assert positively. Was it torn away in great part, in our last operation within the larynx, by means of the laryngeal forceps, and what remained behind, afterwards expectorated with secretions from the bronchial tubes? Such is the probable explanation, and we remember to have seen a like phenomenon occur in an analogous case.

<sup>3</sup> The other organs could not be examined, owing to opposition met with on the part of relatives of the deceased.

"The perichondrium was very much thickened, and seemed to be much denser in structure than is usual. The cartilage itself was very hard, and to the touch and naked eye gave the impression of being ossified. A microscopic examination showed a very marked hypertrophy of the connective tissue of the perichondrium, and a very general infiltration by the same round and fusiform cells that existed in the neoplasm. The vascular development was marked, and in some spots there occurred masses of pigment of irregular shape and size, lying free in the connective tissue, while occasionally some was found inclosed in the cells."

*Remarks.*—There are several points of undoubted interest connected with the above case. And this interest is at once practical and theoretical; practical, inasmuch as the question of diagnosis and treatment should be considered; theoretical, because such a case is rare in some respects, not to say unique, and leads one naturally enough to propound certain questions, the answers to which must be more or less based upon hypotheses, and not, as we could earnestly wish, upon the fair interpretation of many similar or analogous facts. First, with regard to diagnosis; when we had thoroughly examined our patient, and had duly considered his previous history and the signs presented in his person, we came to the conclusion that the intra-laryngeal growths were of a syphilitic nature, and required specific treatment. Acting upon this idea, mercury and iodide of potassium were immediately put in requisition, and administered after what seems the most rapidly efficacious manner; but apparently with no result, so far as arresting any threatening symptoms or producing resorption of tissue was concerned. And here, to be candid, and in making our acknowledgment give a lesson which may prevent others from being guilty of like neglect, we should say that a microscopic examination of the portions of growth brought away with the forceps was not made till death supervened. In some cases such oversight or negligence might prove detrimental to the patient's future cure. In the one we are considering, we do not believe that the treatment should have been modified had we been aware in advance of the revelations which the microscope made known to us after death. The syphilitic infection was affirmed by the patient, and further corroborated by some few signs found upon his body at the time he put himself under our care. In a like position we would ever feel disposed to make use of specific remedies in properly managed doses, until one of two circumstances might arise: first, a manifest *intolerance* should show itself to the medication employed; second, a wholly *negative* action were to be made evident. In either of the above alternatives we would abandon, naturally enough, the method first adopted, and seek after a wiser and more efficacious manner of treatment. Had no signs at all of constitutional syphilis been visible in the case reported, or which we could fairly attach to its existence, still we believe that looking merely at practical results, anti-syphilitic treatment was the one at first indicated. On more than one occasion already we have known of or seen patients who, with a past history of an indurated sore, have never from



that time forward offered symptoms which a well-informed practitioner would feel justified to term syphilitic. At a given period, however, morbid signs became apparent in some organ or tissue of the frame, against which divers therapeutic agents were tried in vain. Specific remedies were then employed, and rapidly beneficial results have followed their use. The influence, it is true, of a constitution tainted with syphilis in becoming the source, as it were, of laryngeal growths in general, has not as yet been accurately determined. Some whose names we could cite, whose authority stands highest on this subject, would have us believe that polypi of the larynx are no more frequent in syphilitic subjects than in others. On the other side, we find those who affirm that syphilis has a direct and evident influence in producing laryngeal growths. With these latter, sarcomatous and other malignant growths are apparently no more excluded from manifesting this influence than are papillomata with a like situation.

For us who believe in the utility of specific treatment in *some* cases, where legitimate doubt may be attached to its existence, if symptoms alone be considered, the wisdom of its adoption is not assailed by any revelations made with the microscope. In considering the diagnosis, the question was asked whether or not our case was one of laryngeal phthisis. It was at once eliminated. The family history of our patient was more than usually good; no member of it had ever suffered from any serious affection of the chest, and the aspect of the larynx, as shown with the small laryngeal mirror, was such as to do away entirely with even a suspicion of that condition. True it is that the great emaciation of the patient during the last few weeks of his life, his abundant expectoration, and occasional complaints of pain in the left side of the chest, were symptoms which might have occasioned anxiety with regard to the condition of the lungs. But there were so many signs, both physical and rational, absolutely wanting in order to permit one to pronounce the word tubercular with any degree of probability, that the mere idea was never for any length of time entertained.

A few cases analogous in many respects to our own have occurred in the practice of Mackenzie, Türck, Cohen, etc., and it may very plausibly be sustained that a professed specialist in throat diseases is bound to be familiar with these examples, and prepared to encounter and recognize similar ones. And further, it may be added in a general way, that if medicine shall ever be ranked amongst the exact sciences, such trust can be hopefully cherished by her votaries only when exact observation of every fact, clinical or experimental, becomes for them an imperative law. When, however, there is a dearth of special facts, and detailed histories of those placed on record are wanting, allowances can properly be made for not detecting features of a portrait at no time fully drawn. Such, in a certain measure, is the story thus far of sarcomata of the larynx. The symptoms peculiar to them are not fully known, and according to Paget

"it would be wrong to draw many conclusions from so small an experience as yet exists of these tumours." Mackenzie states in his work on laryngeal growths (London, 1871), "fasciculated sarcomata constitute a variety of growth, which is comparatively unfrequent in the larynx, only three cases having come under my notice, and there being but six amongst the cases treated by other practitioners." So far as we are aware, no other case of similar structure to those just mentioned has been recorded since. If we may put faith in our researches, we should be allowed to assert that our own case is rarer still, for we have not been able to find a single case of small-cell sarcoma of the larynx (and this is mainly the microscopic feature of the growth so accurately described by Dr. Bull) reported in any one of the late medical publications. With one exception, too, all the cases of spindle-cell sarcoma mentioned in Dr. Mackenzie's exhaustive treatise occurred in patients older than ours.

Beside, the symptoms manifested by our patient up to a very late date were hardly such as to justify a belief in the presence of *any* kind of malignant growth. And here the microscope would appear to be at fault, for it "cannot be relied on for differential diagnosis." "Several cases have come under my notice," writes Dr. Mackenzie, "where the histological features were decidedly those of cancer, whilst the clinical history was of a totally opposite character, and *vice versa*." The above remarks and citations absolve us fully, in our estimation, for not making the diagnosis of *small-cell sarcoma* in our case previous to death. In the instance related, the course of disease cannot be considered very remarkable. Where chondritis, or perichondritis, has followed trouble of a purely inflammatory character, or what is more frequently true, ulcerations caused by laryngeal phthisis, or by syphilis, we read that the abscesses formed, in the majority of cases, point inwards. Sometimes, however, as in the case reported, pus is found in the neighbourhood of the external perichondrium of the thyroid cartilage, and finally makes an exit for itself by a fistulous opening through the integument. It frequently happens also, as in our case, that the surgeon in charge, by a timely incision, allows the abscess to empty itself many hours before it otherwise could.

This is the prudent course to adopt, for in this way and through proper after-treatment the disease of the cartilages may be prevented from extending, or a permanent fistule opening exteriorly (the consequence of blamable procrastination) be entirely avoided.

The abscess pointing outwards appears to us a more desirable state of things than the condition where it becomes prominent internally, and is readily visible with the aid of the laryngeal mirror. Then great dyspnoea and occasionally suffocation are produced before the abscess bursts or is opened. Subsequently, as we are aware, there is imminent risk of life resulting from sudden obstruction of the larynx or trachea by a piece of necrosed cartilage, unless the whole of the diseased portions be removed,

and this very often is an almost impossible task. In a case related by Rokitansky, which has become famous, the anterior perichondrium of the thyroid cartilage had become affected, an abscess formed in the subcutaneous tissue which gave rise to a fistule, and emphysema of the neck ultimately followed.

We happily enough had not occasion to observe this unfortunate consequence of a similar condition with that noted in our case. Whilst in this latter the mobility of the epiglottis was much impaired, as proved by the particles of food which entered the larynx, we did not perceive "the deep red, shiny colour," nor "a much enlarged, elastic swelling of the epiglottis" as described by Tobold, "when the thyroid cartilage is attacked."

Our history is then an exception to a rule admitting of but few. The post-mortem examination has proved to us that had we been able to carry through our purpose, when thyrotomy was determined upon, we would not have been able to take away the whole of the diseased parts without extirpating the larynx.

In view of the late unique case of Professor Billroth, where the larynx of a patient suffering from malignant disease of this organ was successfully extirpated, we may ask, would this operation have been justifiable in our own case? We do not believe it would. When thyrotomy was contemplated our patient was very weak, so much debilitated in fact that the propriety of laryngotomy could not be immediately resolved upon. The chances then of his surviving a more radical operation, and of necessity one in which considerable loss of blood must have been the consequence, were infinitely small. Even had his general strength been greater, we do not at present feel that it would have been indicated. For if we have regard to the very little, if any, permanent improvement in his breathing which followed tracheotomy, and consider the nature of the laryngeal growths, there is good reason for believing that secondary deposits had already been made in the lung tissue, which would have made ultimate cure an impossible result. And now if we examine carefully the experiments of Czerny (1870) on dogs, and the later more startling experiment of Prof. Billroth on man, we do not feel fully persuaded that extirpation of the entire larynx is as yet an operation which should be performed on the human subject in any case.

All the dogs operated upon by Czerny died within a short period of time subsequent to its performance, and by the last accounts from Vienna, recurrence of malignant growths in the bronchial tubes of Prof. Billroth's patient was rumoured abroad, and believed in by many of those best informed about matters in the Allgemeines Krankenhaus.<sup>1</sup>

We do not desire to place an absolute damper upon the spirit which dictates such hazardous surgical methods, but we would have it properly

<sup>1</sup> Since writing the above, Prof. Billroth's patient has died of lung disease of carcinomatous nature.

tempered with thoughtful reasoning, in regard to intercurrent and future suffering and dangers, to the poor fellow subjected to very bold personal initiative.

In surgery, as in most other things, it would be well in practice not to allow the golden rule to become obsolete.

Finally, we wish to consider some point in connection with the morbid anatomy of our case. The growths had their origin doubtless in the sub-mucous layer, and afterwards implicated on one side the mucous membrane, on the other the perichondrium of the cartilages.

They are of undoubted malignant structure, which is shown partly by the number of small cells that enter into their composition, partly by their soft consistence and vascular nature.

More malignant are sarcomata of this kind, according to Virchow, than those of firmer consistence where fusiform cells greatly predominate. One of the characteristic clinical features of all varieties of sarcoma is to extend locally in the tissue, as matrix where they have first taken root, and to recur, more or less *in situ*, after removal.

These facts will account for the appearance of the larynx internally, where nearly the entire mucous lining and submucous connective tissue were incorporated in the sarcomatous growth, and for the differences which exist in the description made of it before and after death.

But the malignancy of sarcomata is not alone made apparent by their great tendency to extend locally; they are also rapidly reproduced in the internal viscera. Transmission takes place through the bloodvessels, and the small cells make their way more readily into the bloodvessels than the larger fusiform cells. In no one of the internal organs do they reproduce themselves more frequently than in the lungs. Our belief, therefore, that the lung tissue of our patient was already invaded at the time of his death, with secondary growths, would appear to be highly probable. The lymphatic vessels and ganglia are rarely infected. This differentiates sarcomata with cancers, properly speaking, where dissemination takes place by the lymphatics—at least in the earlier stages of the disease.

Let us note that, in the history of our case, mention is not made of the lymphatic vessels or ganglia of the neck.

Our attention, in fact, was not directed towards them for the simple reason that they were seemingly in a normal condition.

The condition of the perichondrium and cartilage of the larynx should attract particular attention, because—1st, the apparent ossification of cartilage to both eye and touch is noteworthy when we consider the relative youth of the patient (thirty-two years)—for though ossification of cartilage is not infrequent, as we are well aware, yet it usually becomes evident at a more advanced age. In this instance our belief was (till histological examination made us sceptical), that this change had been rapidly produced by, and was wholly due to, the inflammatory processes,

which will in older patients bring about such transformation after a brief lapse of time.

But after the revelations of the microscope that a portion at least of the cartilage, and more particularly the posterior portion of the cricoid ring which had a brown coloration, was infiltrated with sarcomatous cells and interspersed with masses of pigment "lying free in the connective tissue, while occasionally some were found inclosed in the cells," we were and are in doubt.

We do not know how far the growth itself may have been the cause of this change.

2d. Pathologists have thus far been of the opinion that sarcoma does not invade cartilaginous tissue. Our case distinctly proves the error of such absolute assertion.

*Further:* This question presents itself: Did the laryngeal growth have its origin in the mucous or submucous layer (as is very common, and as we have taken for granted in these remarks already before receiving Dr. Bull's later communication), or did it really begin in the cartilaginous tissue, of which many of the normal cells were found to be atrophied or to have disappeared altogether?<sup>1</sup>

The reply to this, it is perhaps impossible to give at present in a very decided manner. Still the great thickening of the perichondrium, and hypertrophy of its connective tissue, the density and resistance of the cartilage itself, taken in connection with "the marked vascular development and general infiltration of the same round and fusiform cells that existed in the neoplasm," render the latter hypothesis, to our mind, more than probable.

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<sup>1</sup> Oral communication from Dr. Bull.





