TWO CASES
OF
TUBULAR EXPECTORATION FROM THE
BRONCHI,
IN THE ADULT.

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COMMUNICATED BY SIR JAMES CLARK, BART.

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THERE are few cases of this disease placed on record, either by foreign authors or by those of our own country, and, with one or two exceptions, the standard works on the Practice of Medicine make no allusion to it. Dr. Watson, in his late excellent work, has mentioned *two* cases, (one of which is detailed in the following paper,) and remarks, that no similar ones had before fallen under his notice. Several medical friends, in extensive practice, have also informed me that they have met with no instance of the complaint, and in the hospitals and infirmaries of the metropolis it is rarely, if ever, observed. In the practice of the Infirmary of St. Giles and Bloomsbury, where, on the average, 13,000 patients are seen annually, no case of this description has been

noticed by either of the medical officers, one of whom has been attached to that institution for upwards of *thirty* years.

I am aware that there are in London a few individuals who have been liable to the complaint for some time, and who still enjoy good health (amongst them is an eminent member of our own profession) ; but I believe that there is no published account of their cases.

That of a child, narrated by Dr. Warren in the Medical Transactions of the Royal College of Physicians in 1767, under the term of "*Bronchial Polypus*," is generally referred to for a description of the disease, and an account was given of it under the same name by Mr. North, in a paper read at the Royal College of Physicians in 1838, with a description of two cases occurring in the adult.

Case 1.—Mrs. S., æt. 28, married. In December 1836, this lady suffered from bronchitis, not of a very severe character, but attended for some weeks with a distressing cough and febrile symptoms, which were treated in the usual manner. In February 1837, a chronic cough remained, with occasionally some degree of dyspnœa ; and, on the 15th of that month, after having suffered for some hours most severely from a sensation of suffocation, she coughed up, amidst large quantities of froth and mucus, tinged with blood, several arborescent membranous substances, resembling casts of the minute bronchial tubes. As at that period I was totally unacquainted with the complaint, and was unable to find any ac-

count of it in the works of practical medicine which I consulted, I treated it as I should have done a severe case of croup in a younger subject, viz. by leeches to the upper part of the chest, blisters, small doses of morphia, calomel, and antimonials, allowing, at the same time, only a light farinaceous diet.

This arborescent substance continued to be expectorated for three days, diminishing gradually in quantity, to the great, though not entire, relief of the breathing. The patient suffered from a recurrence of the attacks five or six times, at intervals varying from one to three weeks in extent, but each attack being preceded by the same sense of suffocation. During the intervals between the paroxysms, small portions of tubular expectoration were frequently discharged, with a slight cough. By auscultation, the only sign discovered was a mucous *râle*, which increased previously to, and during the paroxysm.

The patient had become in a short time much emaciated ; there was a hectic flush on the cheeks ; her general health was affected ; and, on account of dyspnœa attending the slightest exertion, especially on going into a colder atmosphere, she could not venture to leave her room for a considerable time. By the use of the respirator, however, she was at length enabled to do so, and, in the summer of 1837, to undertake a journey to Devonshire, where her health materially improved, and she speedily regained both flesh and strength, although still occa-

sionally expectorating the same substance, but in very small quantities.

On her return to London at the end of September she immediately found her breathing affected as much as before. There was constant dyspnoea, especially on the least exertion ; inability to remain in a recumbent position ; whilst a tickling, harassing cough, accompanied by a sense of constriction about the thorax, prevented her from enjoying much rest.

On the 15th of October I was sent for during the night, and found her apparently in a moribund condition. The face was livid, the pulse slow and labouring, skin cold and clammy, respiration oppressed, and she was unable to recline in the least degree without a sense of suffocation.

I cautiously abstracted about 12 oz. of blood from the arm, which afforded material relief: the patient was then able to lie down ; the respiration was much easier ; and in the course of a few hours she expectorated much frothy mucus, slightly tinged with blood. No purulent matter was observed at this or any former period. The arborescent tubular expectoration now came off in larger quantities than ever, of a much firmer consistence than in the previous attacks ; and, after continuing for some days, gradually ceased. A discharge of blood always accompanied it, but never to any considerable extent.

The patient had no return of the complaint after this period, but died in December 1841, of a disease quite unconnected with the chest.

Case 2.—February 1841.—The patient, æt. 44, a robust, healthy man, of regular and temperate habits, by profession a barrister, had complained two years since of uneasy sensations about the throat and fauces, for which, iodine and other remedies were prescribed, but without affording any benefit: a journey into the country, however, had the effect of removing them in a few days. The above symptoms, coupled with a feeling of dryness and heat about the frontal sinuses, were attributed to the presence of a stove in his chambers, and which was therefore discontinued. The sensations of discomfort still continuing, the patient, who otherwise was in excellent health, went to Brighton, with the hope that a change of air would again prove beneficial, but after remaining there for a month, he returned with the symptoms rather aggravated. The fauces were inflamed, and there was a small ulcer on the uvula, which was soon cured by the use of the ordinary means, but the patient always complained of a sensation as if there were something about the throat, which he felt a desire to cough up. Soon after Easter, whilst sitting at dinner, a sudden and violent paroxysm of coughing occurred, which lasted for half an hour. After the attack, the voice became husky, and there was a frequent ringing cough, and a sense of uneasiness about the upper part of the sternum.

Small doses of blue pill, ipecacuanha, and iodine, were given internally. Demulcent and astringent

gargles were employed, with the use of inhalations, both of the vapour of water and of iodine; embrocations, cataplasms, and mustard poultices, were applied in succession to the throat, but without affording any material benefit.

Confinement to the house was rarely required, as the symptoms were not of an urgent nature, the respiration being always free, and unattended by any difficulty or oppression. In the autumn of 1840, the patient passed two months in the country, in perfect health, and the respiration was so free, that he was accustomed occasionally to walk quickly up a steep hill in the neighbourhood, reciting loudly Greek verses, "in order to try his wind."

On his return to town, at the end of October, he felt much less uneasiness than formerly, but frequently expectorated small quantities of mucus, and still experienced a sense of huskiness about the lower part of the throat.

On the morning of February 9th, 1841, the patient called on me, and stated, that on coughing slightly before breakfast, some dark-coloured blood had accompanied the expectoration, but in trivial quantity. On the evening of the 10th, I was requested to visit him, as a slight hæmorrhage from the lungs had occurred, for which I prescribed the *infus. ros.*, with iced lemonade, and the application of iced water to the throat and sternum. No violent cough accompanied the hæmorrhage.

11th.—I was again sent for, at 3 A.M., as the

hæmorrhage had recurred, but to a much greater extent ; the blood was of a florid colour, but came up easily, without much cough. The symptoms being now of a much more alarming character, I immediately abstracted a large quantity of blood from the arm, by a free orifice, till a state of faintness was induced. On recovering from this, the patient was seized with a convulsive cough, and brought off a portion of dark flesh-like substance, about two inches long, and with two ramifications from each of its extremities. Its diameter was about four or five lines, and it was evidently tubular. I at once recognized it as analogous in its characters to the substance which I had seen thrown off from the lungs in the former case, and this had the immediate effect of allaying all apprehensions which I had previously felt as to the safety of the patient. The hæmorrhage ceased, and he experienced no bad effect from the attack, but slept tranquilly for some hours. Ice and cold lemonade were the only remedies now made use of.

Dr. Watson saw the patient with me, at noon, when there had been no return of the hæmorrhage. On auscultation, a slight sonorous *râle* was heard at the posterior and lower part of the left lung, and on this account it was judged expedient to abstract 3x of blood from the spot by cupping. Gentle doses of saline aperients were occasionally given, light diet and cool drinks were continued, and the patient was recommended to keep the house for a few days.

He returned to his usual avocations on the 15th ; but on the ensuing day hæmorrhage recurred, and soon after, several portions of tubular substance, bearing a close resemblance to plastic casts of the extreme bronchial tubes, were coughed up, without any exertion, the bleeding soon after ceasing altogether. The voice was now found to be much clearer than it had been for some considerable time. After this period an expectoration of mucus took place frequently, with occasionally small dark coagula. Dr. Watson had recommended the employment of blue pill daily, so as to affect the gums slightly ; but after continuing it for a week, and not finding it to produce the expected effect, it was left off. It was observed by the patient, that, after the cessation of the tubular expectoration, the voice gradually resumed its husky character, to as great an extent as it had ever existed during the two last years.

December 19, 1841.—Nine months subsequent to the previous attack, the same patient whose case is above narrated, perceived, after a fit of sneezing, a sensation under the left clavicle, and in the throat, which he recognized as one which had preceded the attacks of hæmorrhage in February last ; an expectoration of mucus tinged with blood continued through the day, and on the 20th, after a considerable mucous *râle*, hæmorrhage occurred, and was soon followed by a large quantity of the tubular substance : these on being placed in water, floated on the surface.

21st.—A large portion came away with consider-

able hæmorrhage, and expectoration of mucus : several others were coughed up at intervals varying from five to twelve hours, through the 22nd and 23rd. On the 25th, a second portion came away, accompanied by some hæmorrhage. On the 26th, a sort of creeping sensation was felt on the left side of the thorax, chiefly under the clavicle ; and in the morning of the 27th, the patient awoke with a rattling in the throat, as he described it, the hæmorrhage returned, and a third portion was expectorated.

On the 28th of December, slight hæmorrhage continued, accompanied by the throwing off of a tubular substance of very small diameter, almost as fine as a thread in some parts, and ending, as Dr. Warren expresses it, in almost evanescent twigs.

After this period, although the mucus expectorated was for a few days slightly tinged with blood, no further solid substances were brought off, neither was there any return of hæmorrhage.

During this attack, the symptoms were not so actively combatted as in the former one. Expectorants of ipecacuanha, squills, combined with gentle aperients, light diet, and cooling drinks, were found sufficient.

In a subsequent slight form of the complaint, some months afterwards, expectorants alone were administered, although the tubular substances brought off were mixed with blood.

Up to the present time (two years nearly having elapsed) there has been no return of the disease.

It is a curious coincidence that not long after this, the brother of the patient was affected by the same complaint. His case is related by Dr. Watson, in the valuable lectures lately published by him, and the following is a very brief outline :—" Some mouthfuls of florid blood were suddenly brought up, but unattended by any cough, a rattling sensation being felt in the right side of the chest ; the blood came up in gushes, at intervals varying from three to six days ; the smallest quantity being about two ounces, the largest eight ounces. Crepitation was heard about the right nipple, and was increased at the periods of the hæmorrhage. In the intervals, the breathing was tranquil and regular. At the end of three weeks, some ragged shreds of a tubular form were expectorated, but none of them were of very firm consistence." Till the true nature of the complaint was discovered, Dr. W. mentions that the anxiety of the patient was extreme, and I know that the friends were equally alarmed, until the tubular substance was noticed, when all fear of danger was immediately removed.

The accompanying sketches* were taken by my patient himself, whilst the arborescent substances were in a recent state.

In giving an account of the above cases, I have used the term "*Tubular Expectoration from the Bronchi*," in preference to that employed by Dr. Warren, viz. *Bronchial Polypus*. The adoption of the term '*Polypus*,' by Dr. Warren, depended, most

* See Plate IX. figs. 1 and 2.

likely, on its having been previously used to designate the false membrane thrown off in croup. Indeed, C. F. Michaelis, in his treatise "*De Angina Polyposa sive Membranacea*," 1778, thought it necessary to point out that it was an *inorganic* concretion formed by coagulation and inspissation of some fluid, and differing altogether from *organic* polypus.

Those specimens of the bronchial concretions which I have had the opportunity of examining, seemed, with few exceptions, to be hollow, and to contain both air and blood; they floated on the surface of the fluid into which they were thrown, and after the latter had been repeatedly changed, the blood was given off, and they assumed a greyish white appearance. Their hollow cylindrical form was evidenced also by examination under a powerful microscope. When kept in *diluted* spirit, they gradually lost the air contained in them, and sank to the bottom of the glass, and in the course of a few months were totally dissolved, giving to the fluid a mucilaginous consistence. When the fresh specimens were placed in *proof* spirit, they speedily shrank into very small compass, and sank to the bottom of the glass, but though losing their original appearance so soon, were preserved for a much longer period than the others. In Dr. Warren's case, the great proportion of these substances were from two to three or four inches long, white and opaque; at first they were specifically heavier than water, but after a day or two, they swam. Ruysch*

* Epist. Anatom.

describes specimens which he had an opportunity of observing in one case, as not being tubular ; they were not expectorated however during the lifetime of the patient, but seen in the air-tubes after death.

The *cough* seems to vary in different cases of this complaint, and not to be of that intense character which it generally exhibits in croup ; but my *first* case is even an exception to this rule, for in it, it will be remembered, dyspnoea existed to a great extent, accompanied by a harsh suffocating cough, and prolonged inspiration ; the attempt to fill the lungs with air caused evident congestion, with lividity of the face and urgent symptoms, which were not entirely relieved until the tubular substance had been thrown off. It seems probable, although the greater number of these tubes may remain permeable, and allow of the passage of air, that in some cases the smaller tubes are completely blocked up, giving rise to symptoms resembling even those of pneumonia or of spasmodic asthma. In the *second* case which I have related, the cough, although of a ringing character occasionally, was never accompanied by a feeling of suffocation, nor even of oppressed respiration, except on one occasion. In Dr. Warren's case, " the little patient awoke suddenly, and was almost choked, in bringing up, by coughing, a large polypous concretion."

It will be remembered that in *croup*, also, the cough does not *always* exhibit the same character ; and in cases mentioned by Mons. Hache, in his

thesis, and by Dr. Home, of Edinburgh, there was *none* at all.

Hæmorrhage is not a constant accompanying symptom : in Dr. Warren's case, as in that of Dr. Nicholl, it was *occasional* only, and that too when the smaller pieces were thrown off. " One large concretion came up without either blood or mucus." Dr. Warren mentions, that after the space of two years, his little patient had had no return of this, nor of any other pulmonic affection. In none of the cases recently described does the hæmorrhage appear to have been of any large amount : it depended evidently on the partial detachment of the plastic substance, from the turgid mucous membrane (which is probably much more vascular than usual), and it increased with the progressive separation between them, but ceased soon after the expulsion of the former. The abrasion of the surface alone might prove a sufficient cause for this hæmorrhage, even if no immediate vascular connection existed between the mucous membrane and the tubular substance : this, however, is not at all improbable, as the false membrane in diphtheritis, in detaching itself from the mucous surface (by Bretonneau's account), leaves points, by which blood transudes. Andral would deny the existence of any blood-vessels between the mucous membrane, and these false membranes, had not Guersent affirmed that he had seen them ramifying on the latter in croup.

The cause of tubular bronchial expectoration

would seem as yet not to be clearly defined. The disease, however, seems to be chronic inflammation of the mucous membrane of the bronchial tubes, of a specific kind.

As in croup, and pharyngeal diphtheritis, the exudation appears not to depend on the intensity of the inflammation so much as on some peculiar action of the parts producing it. Andral attributes the morbid secretion, in these diseases, to acute hyperæmia of the mucous membrane.

The inflammation may be confined to one lung, or may attack both simultaneously. In my second case, the left lung appeared to be alone affected, whilst in the first, both were equally involved.

Lieutaud, who in his "Synopsis" (obs. 392) relates a case of this disease in a child, attributes it to a scrofulous diathesis, with metastasis to the part so affected. Dr. Warren's case corresponds certainly in this respect with Lieutaud's, his little patient being of a strumous habit; and as a severe pain in her heel gradually increased (an abscess eventually forming at that part), so did the paroxysms of oppressed respiration become less frequent, and the expectoration of tubular substance diminished. This, however, may have been, and most likely was, a mere coincidence. Certainly, in those cases which have fallen under my notice, as occurring in the adult, no trace of such diathesis was apparent.

The disease is of too rare occurrence to enable us to pronounce whether it is hereditary or not. Still, the fact of two brothers, of different callings,

and living in different places, having so rare a disease, tends very strongly to show, that it depends on some inherited peculiarity of constitution. The more severe complaint, which may be considered in some respects analogous to it, and to which the French authors have applied the term of "*Angine Couenneuse*," appears to be so occasionally. Thus, by Bretonneau's account, the Empress Josephine died from the effects of this disease; her daughter, Hortense, was for some time subject to it; the son of the latter died from an attack of croup, whilst her nephew, the Duke of Leuchtenberg, consort of the Queen of Portugal, fell a victim, at a later period, to a complaint of a similar nature.

Croup too is observed occasionally to attack members of the same family, though residing in different localities. The brothers, to whose cases I have alluded, both attribute their complaint to the use of stoves in their rooms.

Prognosis.—A fatal termination is not so much to be feared in this disease as in croup, or in pharyngeal diphtheritis. This may be accounted for, by taking into consideration, that the two latter diseases attack those parts of the respiratory apparatus which will permit of little obstruction, without causing the most alarming symptoms, viz. the trachea, or larynx, and the glottis; whilst a large number of the minute bronchial tubes may become impermeable to air for a time, without materially interfering with the vital functions. In those cases of tubular bronchial expectoration which I have seen

or heard of in London, the patients, after the first or second attacks, have regarded their recurrence without any alarm. Dr. Willis mentioned to me the case of a gentleman suffering from this complaint (the only one he had met with of this description), in which, on first witnessing the expectoration, he naturally felt some anxiety, until his patient assured him that he was accustomed to it, and that it was of no consequence. Dr. F. Nicholls, in the "Philosophical Transactions," No. 398, narrates a case in which this hollow tubular substance was coughed up in greater or lesser quantity, for seven years, sometimes with, at others without blood, the patient remaining, all this time, stout and in good health. In Mr. North's two cases, likewise, the health was perfectly re-established after a time.

We have every reason, therefore, I think, to give a favourable prognosis as to the eventual result, in cases of this malady, when we are once assured as to its true nature, and that it is not complicated with phthisis, or other serious disease of the lungs. The higher the plastic formation takes place in the air-tubes, the more severe will be the symptoms, and should both of the larger bronchi be simultaneously attacked (a very rare occurrence indeed), extreme danger would naturally be apprehended.

When bronchial tubular expectoration is complicated with other diseases of the chest, the prognosis will of course be much more unfavourable, although the presence of the two diseases would seem

to depend rather on coincidence, than on cause and effect. Tulpius, in his "Medical Observations," narrates a case of this description, occurring in a phthisical patient, attended with fatal hæmorrhage: "Excretis hisce surculis, effudisse ipsum ipsam cum sanguine vitam." Tulpius, however, as well as Bartholine, mistook these substances for blood-vessels of the lungs, thrown up by coughing. In Dr. Nicholls' second case, there was much hæmorrhage also, the patient, some time after, dying of phthisis. Morgagni's case (Epist. 21, Art. 20) occurred in a young person labouring under peripneumonia: "Qui materiem albam, pauxillò sanguinis tinctam, multoque muco obductam, qualem nunquam antea medicus viderat, et mox ante ipsam mortem, ramosum polypum bronchiale ejecit." De Haen (Rat. Med. t. 2,) mentions that his patient was suffering from pleurisy, when "materiem albam densam ejecit, oblongam ramosamque."

Treatment.—The rigorous discipline which has been adopted in some of these cases, appears unnecessary. I fell into this error, I think, in abstracting so large a quantity of blood in the first attack of hæmorrhage, which occurred in my second case; but the speedy expulsion of the tubular substance, after the faintness which accompanied it, fortunately prevented my following up the same active mode of treatment, as I then had the opportunity of recognizing the true nature of the complaint, and the cause of the previous hæmorrhage. It may, however, be a question, whether the syncope induced by the bleeding did not facilitate the separation of

the false membrane, and cause its ejection at an earlier period than would otherwise have taken place. I believe that it is very seldom that bleeding from the arm will be required in this complaint, and that too only where congestion of the lungs occurs, when the abstraction of a small quantity of blood may afford relief.

Neither mercury nor iodine proved of much service in the cases which I have narrated ; and in any future instances, I should feel disposed to rely more on the employment of ipecacuanha, squills, and other mild expectorants, conjoined with light diet, than on a more vigorous mode of treatment.

Dr. Warren mentions that, in his case, in which there was a short, dry, and almost incessant cough, with perspirations at night, great wasting, and attended by a sense of weight in the chest, but not of pain, much relief was obtained by the continued use of the oxymel scillæ.

Since writing the above, my friend, Dr. G. O. Rees, has mentioned to me the case of a woman in Guy's Hospital, who was lately admitted for severe bronchitis ; but other anomalous symptoms supervened, which could not be explained. On a *post-mortem* examination, the whole of the bronchial tubes were found to be filled with a tubular substance, similar to what has been described, as were the trachea and larynx. Traces of pneumonia were observed in each lung, and, at these spots, no plastic matter could be found in the tubes.