Original Articles.

A CASE OF DIFFUSED GANGRENE OF THE RIGHT LUNG, FOLLOWING PYOBRONCHIAL-VEOLARIS.¹

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I WAS asked by the husband of a patient to meet her at the dentist's, where she was to have all her teeth extracted, and administer the ether. The operation was done by Dr. F. F. Gage, with great rapidity and skill, on the 8th of October, 1885. During anæsthesia she collapsed, and for five minutes seemed moribund. The anæsthetic having been suspended, the blood cleared from the mouth, a subcutaneous injection of a drachm of brandy given, the operation was completed. She rallied in half an hour from the ether, and was driven home in a close carriage.

This patient was thirty-one years old, and had been married four years. Her father died of pneumonia; her mother, now living, lost her teeth several years ago, as did the patient's brother. A paternal grandfather died of cancer. Aunts and uncles are presumed to be healthy. She had never been a robust woman, and had been under treatment for various ailments since childhood. She was specially subject to chills, which were called malarial, but which were probably due to the condition of her gums, which had been diseased for eight years or more. She always suffered abnormally from the usual cold of winter, and then experienced difficulty in respiration. The summer before the teeth were removed she had amenorrhœa and other symptoms of pregnancy, which condition an examination proved not to exist, and she improved greatly on spending the summer at the shore.

On the day before the operation she had one of her chills, but it did not confine her to her chamber. The teeth having been extracted on the 8th, a slight cough and fever developed on the 9th. The gums healed in quickly, and such fetor was noticed as would be expected from the suppurating surface, and was relieved by a myrrh lotion. For a day or two she seemed to be recovering from the operation, as, on the 10th, the temperature was 98°; but, on the 13th of October, pneumonia was suspected, because the temperature shot up to 103.4° (the highest point it reached). The pulse was as high as 120 on one day only. There followed cough; scanty expectoration of not very viscid sputa, at rare intervals, rusty. During the first few days there was some delirium. The physical signs, at first, were negative; to the last, the front of the chest was clear, and the heart-sounds normal. Evidences of consolidation were heard in the middle of the right back, and extended downwards and upwards, till little or no free respiration could be heard. Once or twice the left back was suspected, but the sounds were transient, and proved to be transmitted. There was little or no pain. The sputa, never abundant, grew more and more fetid. This was at first ascribed to the condition of the gums, but these healed with remarkable speed, and probably, by the third day, presented no suppurating surface. After one or two remissions, which, for a day or two at a time, gave hope, she died, in full consciousness, at midnight of the 31st of October, on the nineteenth day of the disease. Dr. Whittier saw her twice in consultation. The chart is appended. The autopsy was made by Dr. Fitz on the 2d of November, and he has kindly sent me his notes.

¹ Read before the Norfolk District Medical Society.

AUTOPSY, THIRTY-FOUR HOURS AFTER DEATH.

Rigor mortis present. Frame small; well-formed; abundant subcutaneous fat-tissue. Head not opened. Nothing abnormal found on examination of heart and left lung. Right lung adherent throughout by fresh adhesions, except at the base, in front and behind, where circumscribed cavities were found. In each were about four ounces of foul-smelling, opaque, greenish-yellow fluid; these cavities communicated with the interior of the lung through sloughing tissue. The right upper lobe showed nothing abnormal; the lower lobe moderately retracted. A few cavities as large as English walnuts were present, with sloughing walls and offensive contents. In several instances, the beginning cavity-formation followed the course of the bronchial distribution, dilated bronchi being thus suggested. There was but little solidification of the lung-tissue between the gangrenous centres. The spleen was slightly enlarged and soft; the kidneys and liver presented the appearance of parenchymatous degeneration. Bladder not abnormal. External examination of stomach and intestines showed nothing abnormal. The sigmoid flexure formed an unusually large loop: adherent to its mesentery was the left ovary, apparently more than two inches from the uterus. The latter organ, of the average size, was malformed, consisting of but one horn — the right. The left horn was represented by a thin, flat, red band, within the broad ligament, and to which was attached a fibromyoma as large as a plum. About an inch and a half from the attachment of the band to the uterine wall, the round ligament was given off. The left Fallopian tube was not recognizable. The left ovary normal in appearance. Diagnosis: Gangrenous broncho-pneumonia; putrid empyema; malformation of uterus (one horn developed, the other solid and rudimentary, with a fibro-myoma).

In the chart, you will notice the low run of the pulse, temperature, and respiration; the course of the disease — nineteen days — so different from the record of a frank case of pneumonia. The remissions of temperature on the second and thirteenth days are worthy of note. You will also see how the temperature fell after moderate doses of antipyrine, which was always given with brandy. The treatment was liberally restorative: she took enough milk, champagne, and other food and stimulants readily, and retained them all. The slight delirium spoken of above did not cloud her mind, and, as has been said, she died aware of all

that was going on around her, and was so mistress of herself, that she expressed a desire to make her will; and, after it was drawn up, she signed it very shortly before her death.

The disease of the gums from which the patient suffered is called, by the dentists, *pyorrhœa alveolaris*, and by some Riggs's disease. It appears to begin with a calculous deposit around the necks of the teeth, and is said to be not uncommonly found in the mouths of very young patients—say, even those of two years. The deposit can be seen, and its presence is also manifested by a more or less distinct line of inflammation about the necks of the teeth. The gums become more or less congested, and cover the deposit, while the mischief proceeds in secret, the gums bleeding easily. If not removed, this deposit will go on hardening, clinging more tenaciously to the necks of the teeth, and extending its boundaries . . . the soft tissues shrink or recede . . . the disease attacks the hard tissues, and they yield more or less rapidly. The thin edges of the alveolar process are the parts now involved, and, from the breaking down of their structure, we have an easily perceptible discharge of pus. It is more intractable when hereditary.² The remedy for this formidable disease is the early removal of the deposit, or extraction of the teeth when it is advanced.

Gangrene of the lung is a rare disease. The case under consideration is the first in my own practice, and I recall only one or two in my hospital experience. In 1866, Dr. Austin Flint had seen fifteen cases, and cites the record of 1,069 autopsies by Lauthna, of Vienna, who found among them only five instances. Fischell, of Prague, in 3,437 necropsies, noted 75 cases of pulmonary gangrene. Ten years' post-mortem records in St. George's Hospital afford nineteen cases only. The fatality of the disease is large; the patients generally die before the slough can be cast off, its presence setting up septicæmia or secondary pneumonia. Dr. Coupland³ has collected some cases, principally reported with a view to operative procedures, in an able and interesting paper in the *British Medical Journal* of the 5th of September, 1885. The cases in the autopsy-book of the Middlesex Hospital, from 1875 to 1885, numbered thirty-eight. In a paper in the *Boston Medical and Surgical Journal*, 26th of October, 1876, Dr. Thomas W. Huntington reports thirty-two cases in the Massachusetts General Hospital, from 1857 to 1875. Of these, seven were discharged well, six much relieved, three temporarily relieved, five not relieved, eleven died. In summing up, Dr. Huntington finds that 73.3 per cent. of cases uncomplicated recovered, while complicated cases showed 80 per cent. of deaths.

The most frequent cause has been thought to be acute pneumonia, ending in gangrene, but I think that if a full history of each case could be procured, most of the patients would be found to have been exposed to some septic influence. Again, drunkards are peculiarly liable to this form of inflammation of the lung. Blocking of the pulmonary vessels does not necessarily lead to gangrene, but rather to that form of necrosis which is known as hæmorrhagic infarction, unless the occluding matter be of septic character. The inhalation of putrescent matter is a cause, such as retained bronchial secretions, or morbid extra pulmonary products, or foreign matter from without. Malignant ulceration in the mouth is stated as a cause in

more than one case. It often happens that after the first urgent symptoms of impaction had ceased, the patient lies in a condition of comparative comfort. Dr. Sydney Coupland cites illustrations of all these instances. Octavius Sturges adds cancer, carious vertebrae, and aneurismal tumor. Dr. Coupland also says the relationship between gangrene of the lung and acute lobar pneumonia has hardly yet received satisfactory explanation. Laennec considered that the surrounding inflammatory change was purely secondary, and there is, no doubt, much truth in this view of the case. But yet there remains a fair proportion where there seems no room for questioning the fact that acute pneumonia has ended in gangrene. In the rest, the limitation of the pneumonic areas, the distribution of the gangrenous foci, point to the hepatization being secondary to the gangrene. At the same time, no adequate cause for the gangrene can be assigned.

Octavius Sturges⁴ is strong in statement that true pneumonia never ends in gangrene. He writes that the cases which are obnoxious to gangrene are precisely those which are least liable to true pneumonia; are those, it almost might be said, where the state of the blood renders such an occurrence impossible. We have the testimony of authors that the liability to gangrene varies inversely with the liability to pneumonia. Gangrene of the lung is more rare in enteric fever than in typhus. Pneumonia is more rare with typhus than with enteric fever. . . . Dr. Stokes, who is little prone to accept doctrines on the mere authority of others, insists on the close connection between gangrene and what he elsewhere describes as "typhoid pneumonia." . . . A separate form is met in children. . . . The extravasation of blood (hæmoptysis) may terminate in a gangrenous cavity, the access of air to a lot determining its putrefaction, and, eventually, that of the surrounding tissues. M. Grisolle, who concurs with Frank, Laennec, and Andral in regarding this event of pneumonia as very rare, investigated the history of seventy reported cases of pulmonary gangrene. He relates that he could hardly find five out of the seventy which could, in strictness, be regarded as examples of pneumonia so terminating. Dr. Thorowgood gave Dr. Sturges particulars of a case, in which the characteristic and overpowering fetor of pulmonary gangrene arose in a pneumonia of no great severity, and which ultimately recovered, under his care, at the West London Hospital.

Gangrene of the lung occurs in two forms: the diffused and the circumscribed.⁵ In the former, the gangrene extends over a considerable space, sometimes involving the greater part of a lobe. This is the graver form, and almost of necessity proves fatal. The circumscribed form is that which usually occurs. In this kind, the gangrene is confined to a space limited in size from that of a bean to a hen's egg, the limits being sharply defined. Even when circumscribed, it is an extremely grave affection, but recovery takes place in a certain proportion of cases. The chances of recovery are differently estimated by different writers, which may, perhaps, be accounted for by supposing that the diagnosis of gangrene is not infrequently based on insufficient grounds. Fetid sputa are not restricted to this disease. Among the conditions simulating gangrene of the lung, are the sloughing of pulmonary tissues in tubercular cavities, a superficial slough of a

² Dr. George A. Mills. *Dental Cosmos*, Vol. XIX.

³ *British Medical Journal*, September 5, 1885.

⁴ "Natural History and Relations of Pneumonia," London, 1876.

⁵ Flint's "Practice of Medicine," first edition.

portion of the bronchial mucous membrane, and the retention of old secretions in cases of bronchiectasis.

We thus have the history of a patient never very strong, who, after long disease of the gums, under which pus was secreted, fell a victim to pulmonary gangrene. As malignant ulcerations of the mouth are a cause of this disease, so the condition of the alveolar mucous membrane placed her in a favorable state for the onset of the fatal illness. Gangrene of the lower lobe of the right lung set in, and, to the septic condition of the mouth, may be added, as a possible cause, entrance of blood into the bronchi during the operation of extraction, particularly during the collapse. Perhaps the collapse, too, may have been caused by the plugging of a bronchial tube with blood flowing from the gums into the trachea during anæsthesia. The decomposition of such clots, even when caused by hæmoptysis, has been noted above as originating this form of disease. Careful search was made in the autopsy for the signs of any such plugging, but none could be found. I am more inclined to place the cause of death with the long disease of the gums, favoring the fatal illness.

CASE OF ATTEMPTED SUICIDE FROM THE INGESTION OF THIRTY-SIX GRAINS OF MORPHIA, WHICH REMAINED IN THE STOMACH FIVE HOURS. RECOVERY.

IN THE PRACTICE OF DR. L. E. LEMEN, DENVER, COL.

REPORTED BY SAMUEL A. FISK, A.M., M.D., DENVER, COL.

WILLIAM P., aged thirty-eight years, a German, six feet in height, about two hundred pounds in weight and of powerful build, becoming tired of life attempted suicide by taking a large dose of the sulphate of morphia. At ten o'clock on the night of March 6, 1887, in the presence of a woman with whom he had had a disagreement, he opened a one-eighth of an ounce bottle of Powers & Weightman's sulphate of morphia, which he had bought for the purpose of committing suicide, poured out a large quantity on to the palm of his hand, and ate it down. The drug remaining in the bottle proved to weigh twenty-four grains, making the amount that he took in the neighborhood of thirty-six grains. After taking the drug he remained in the woman's room some ten or fifteen minutes, when, under the apprehension that a physician was being called, he ran down stairs, jumped into a hack, and was driven about a mile and a half to his home. On the way he opened a small vial of the spirits of chloroform, that he had with him, and drank a fluid drachm. When he reached his house and got out of the hack, the driver thought he was drunk. P— afterwards stated that the last thing that he remembered was his getting into bed on reaching home. He drank freely of water and, on the arrival of the woman with whom he had quarreled, he was given a couple of glasses of milk, and a physician was summoned.

Half-past twelve, March 7th. Two and one-half hours after the ingestion of the drug, Dr. L. E. Lemen, who was called and who took charge of the case, arrived. Respirations were six per minute; pulse sixty-eight. Pupils pin-hole. Patient cyanotic. Ten grains of tartar emetic were placed upon the tongue and an attempt was made to wash it down, but the reflex effort of swallowing could not be excited. The at-

tempt and the dose were repeated, with a like effect, in about twenty minutes. Twenty minims of the fluid extract of belladonna were given hypodermically at 12.30, A.M., and the dose was repeated at 12.45, and again at 1.15.

Quarter-past one, A.M. Three and one-quarter hours after ingestion of the drug, I arrived with my battery. Found the respirations three per minute; pulse eighty-four. Pupils moderately dilated, due, no doubt, to the belladonna. We immediately applied the galvanic current from eighteen cells of a McIntosh Battery, the negative pole being placed over the right superior, carotid triangle, the positive over the præcordium, and the current interrupted very slowly. Galvanism and the belladonna brought up the respirations, both in depth and number.

Two, A.M. Four hours after ingestion. One-sixth grain of apomorphia was given hypodermically and an attempt to wash out the stomach with a soft-rubber tube was made, which failed, as the tube was not stiff enough. The hypodermic injection of apomorphia, one-sixth grain dose, was repeated in about twenty minutes after the first injection and followed in twenty minutes more by a third injection, making one-half grain in all of the drug that was given hypodermically, but it was of no avail.

Three, A.M. Five hours after ingestion. Galvanism having been kept up pretty constantly, an œsophageal tube was introduced into the stomach and it was thoroughly emptied and washed. The citrate of caffeine, grains fifteen, in solution, was then administered by the tube and the tube withdrawn. At this point the respirations ceased, the heart stopped beating and could not be heard over the præcordial region. The face and surface of the body became pallid, and we were afraid that life had flown.

Galvanism from eighteen cells was applied as before, and after three or four minutes a shallow inspiration occurred, and a second, and a third. Electricity was continued, the expirations were increased by compressing the chest, the heart started beating again, the respirations were restored, and the patient broke out into a profuse cold sweat.

Four, A.M. Six hours after ingestion. The stomach tube was introduced a second time and fifteen grains more of caffeine administered. On withdrawing the tube the pulse and respirations stopped as before, and were reproduced by galvanism as described. The respirations soon became Cheyne-Stokes in character, four or five series to the minute, and from that time for several hours but little was done except to stimulate the inspirations with a weak galvanic current whenever they seemed to flag.

Nine, A.M. Eleven hours after ingestion. Respirations eighteen per minute and fairly regular. Pulse one hundred. Patient unconscious.

Eleven, A.M. Thirteen hours after ingestion. Gave strong coffee, by spoonfuls between the cheek and the teeth, some of which would be drawn into the trachea and produce a violent coughing and the patient would thus become partially aroused, but dropped off instantly into slumber again. Could arouse him and make him cross for an instant or two, by pulling his beard. Slapping the face with a wet towel produced contractions of the orbicularis palpebrarum and corrugator supercillii. The citrate of caffeine in six-grain doses was administered every two hours for four or five doses, and we kept pouring down black coffee by