A COURSE OF
LECTURES ON SURGERY,

DELIVERED IN THE
MEDICAL SCHOOL OF CAMBRIDGE.

By GEORGE MURRAY HUMPHRY, Esq.,

Downing College, Surgeon to Addenbrooke's Hospital.

LECTURE XXXIII.

MELANIC AND GELATINIFORM CANCER.

The nature of the pigmentary matter in melanic cancer; how far to be regarded as an important element influencing the progress of the disease; cases of the disease; order in which the pigmentary and the other elements are observed to be produced.

Anatomy of gelatiniform cancer; its resemblance in general features to the other varieties of cancer; parts most frequently affected by it; description of specimens of the disease.

THE term "melanic" is applied to those cancerous tumours in which pigmentary matter, resembling that in the choroid coat of the eye, is found intermixed with the other elements of the structure. It may be contained in the cells, between the nucleus and envelope, or in the nucleus itself; in the fibrous tissue; or in the spaces intervening between the cells and the fibrous tissue. It may occur in either scirrhous or encephaloid tumours. Probably it is sometimes met with in the other varieties of cancer. It is most common in the encephaloid. The proportion which it bears to the other elements of the tumour, varies very greatly. In some instances there are only a few black specks scattered through the mass; in others, it exists in such quantities as to give the whole substance a grey or dark brown, or jet black colour. Moreover, it may be equally distributed throughout the tumour, giving an uniform dark colour to the whole; or it may be accumulated at particular points, when the tumour has a spotted appearance, or presents alternating light and dark strata. Occasionally the pigmentary granules are found to be aggregated together in dense masses with scarcely any traces of organic structure; and it not uncommonly happens that a small black spot in the otherwise healthy tissue, is the first sign of the existence of the disease.

The nature of this pigmentary matter is uncertain. Structurally it is composed of exceedingly minute molecules, so minute that they are said to be capable of passing readily through membranous walls by endosmosis. Dr. Bennett has ascertained by experimenting on specimens, that the colour is destroyed by nitric acid and chlorine, "a character," he remarks, "which at once distinguishes it from the black matter which so commonly accumulates in the bronchial glands and lungs of old people, and in the black phthisis of colliers. In the latter case the black substance is undoubtedly carbon; in the former, its nature is unknown." He has little

doubt that it originates in some change which the blood undergoes; for he has found it frequently, in the same specimen, undergoing all the intermediate tints from blood red and rusty brown, to the deepest black. The same author further observes, that it has been imagined to consist of sulphuret of iron, and the frequency with which old exudations in the neighbourhood of the intestines are tinged black would at first seem to favour the supposition. But in a large specimen of melanosis from a horse, tested at his request, no trace of sulphuret of iron could be found. Vogel conceives that the colouring of the so-called melanotic tumours is produced by a variety of causes; that in true melanosis, where the colour is brown, of a bistre tint, black or grey, it depends upon the presence of dark pigmentary granules, the chemical nature of which is unknown; in a false variety of melanosis, where the colour is slate grey, or greenish black, it depends upon sulphuret of iron; and in another false variety, where the colour is blue, violet, or brownish black, it results from an altered state of blood-pigment.

It is not easy to decide to what extent this melanic deposit is to be regarded as an important element in cancerous tumours; or in what way it modifies their progress, if it does so at all. The malignant qualities of the melanic cancers depend, doubtless, not upon the presence of this deposit, but in the same manner as in other cancers, upon the abnormal tendency to cell-development, and to decay of the cellular and other elements of the mass. The melanic cancers are perhaps somewhat less liable to ulcerate than the scirrhous or encephaloid; they attain often to greater size, with less destruction of the surrounding tissues, and they infest a greater number of organs in the same individual; but it is probable that these peculiarities are dependent upon other qualities of the tumour, and are only associated with pigmentary granules in its substance. At any rate, we know that pigment-grains of a similar kind do not exert any evil influence upon the textures when they are deposited in them under other circumstances. For instance, they are often found in the skin and the mucous membrane of the bowels, when those textures have been for some time the seat of chronic inflammation; and we do not find that their presence is productive of any mischief; they appear to be perfectly inactive.

I will relate to you two rather peculiar cases of this form of cancer, which, with a single case of melanosis of the eye-ball, are the only ones that I have happened to see. A healthy-looking robust man, aged 50, presented himself at Addenbrooke's Hospital, in October, 1845, with a broad flat ulcer upon the inside of the left ring toe. It was an inch and half in diameter, had an uneven, dark, dirty surface, a hard base, and an everted livid edge. There were also in the integuments of the middle toe, and of the outside of the instep, several hard tubercles, about the size of a split pea, of livid, dark-blue, and black colour. At one part they were set together in a row, and looked, at first sight, not unlike varicose veins. The immediately surrounding integuments and other tissues were indurated. Below Poupart's ligaments were two or three enlarged and very

hard absorbent glands. Neither the ulcer, the tubercles, or the diseased glands, were at all tender or painful. He stated that three or four years previously, he had observed on the ring toe, a small hard knot, similar to those now existing on the instep. He "thought it a blood-blister, and took no great notice of it." In the last winter it had increased in size; he used to scratch it, when it bled and it soon scabbed over. It gradually grew larger, and at length ulcerated. In July, 1846, I saw this patient at Ely; he was in bed, thinner and paler than in the preceding October, but did not look so ill as might have been expected from the severity of his local complaint. The left lower extremity was covered with a number of black cancerous tubercles scattered about the skin. They were most numerous on the inside of the thigh, and the outside of the leg, but did not follow the course of any particular absorbent or venous trunks. They commenced as little black specks in the cutis, the structure of which appeared to be altered no otherwise than by the presence of the pigmentary matter, which gave the black colour to it at these spots. The spots gradually increased in size, became raised above the level of the skin and hard; some other substance, in addition to the pigmentary, being now evidently mixed up with the tissue of the cutis. The tubercles went on growing till they attained the size and shape of a split pea or bean; and in some places they were confluent, forming an uneven irregularly-shaped mass. Then a slight depression or ulcer formed at the centre, scabbed over, and again ulcerated; so that at length an uneven excavation was produced, with hard, raised, everted edge, and a thin dirty sanious discharge. Several of the ulcers were as large as a halfpenny or penny piece; and some of them were confluent. A great part of the dorsum of the foot was occupied by a deeply cleft, black or yellowish black ulcer, upon a raised hard base, with everted edges, and with foul, fetid, dark discharge—a horrible specimen of disease, such as, happily, one but seldom witnesses. Another large ulcer of similar character had involved and partly destroyed the ring and little toes. At the upper and inner part of the leg, and on the outside of the thigh, beneath the integuments, which were adherent over them, were several hard nodulated masses, as large as walnuts or pullets' eggs. There was also a mass of enlarged and indurated glands at the upper and inner part of the thigh. The disease appeared to stop short at the bend of the groin, and though I had him stripped and examined him very carefully, no trace of it could be discovered in any other part of the body; nor was there a symptom of its existence in any internal organ, which accorded with the sound state of his general health. He died in the early part of September. No examination was made.

In this case the progress of each tubercle, and that of the disease generally, was such as is ordinarily observed in scirrhus cancer of the skin; no variation having, so far as we can judge, been produced by the addition of the pigmentary matter. The limitation of the disease to the one member which was so abundantly loaded with it, is remarkable.

The second case is that of a healthy woman, aged 46, of ruddy complexion, and light-brown hair, who came to the hospital in August, 1846, to show a black warty growth on the ulnar edge of the left palm, near the wrist, about the size of a sixpenny piece. There was no hardness about it, and it resembled a common wart, except that its situation was unusual, its colour black, and it was very tender and painful, the pain shooting up the forearm. Minute black prolongations, like spiders' legs, could be seen through the cuticle, shooting from the wart into the adjacent skin. No other formations of a similar kind, nor any enlargement of absorbent glands, could be found. She said that a small wart had existed at this spot for ten years, or more, slowly increasing in size; but of late it had become more painful. I sponged the wart freely with strong nitric acid. When the slough so produced had separated, it left a bluish, unhealthy-looking ulcer, with a dark margin. She still continued to suffer severe pain in the part and shooting up the inside of the arm to the breast; accordingly, I made a free application of potassa fusa to the ulcer and to the surrounding integuments. This left a healthy ulcer, which healed quickly, and apparently soundly, but the severe shooting pains about the arm, the breast, and the shoulder, continued for some time, though I could discover no disease to account for them. At the latter end of October the cicatrix in the palm became a little red and tender, and on its edge we observed a minute brownish spot in the skin, not larger than a pin's head. This was quite recent, and she said the disease had begun in that way. Her stomach and general health were at this time rather disordered, so she was put upon a course of medicine, and gradually got better, the pains diminished, or nearly subsided, and, though the black spot remained, the affection appeared to be so slight, that I discharged her on the 9th of January, 1847. In the early part of April, 1847, she came again, on account of an oval lump in the axilla, of the size of an egg, smooth and moveable both under the skin and upon the parts beneath. She suffered severe pain in the swelling, and radiating from it all over that side of the chest, and about the shoulder. There was still the small dark speck upon the edge of the cicatrix in the palm. We thought it better to attempt the removal of this mass, whatever might be its nature; accordingly, I made an incision through the integument, when the black colour of the tumour confirmed our worst suspicions as to its nature. When this had been excised, a number of little hard, black, round masses, varying in size from a pin's head to a nut, presented themselves in the cellular tissue of the axilla. I removed all that I could find with the fingers and the knife, clearing out the axilla nearly up to the clavicle, and then cut out the diseased integument of the palm. The tumours presented the ordinary appearance of melanosis, being for the most part of jet black colour; the large one was, in parts, of a brownish tint, or even lighter colour, and in one place it resembled the ordinary encephaloid cancer. The wounds healed, and she returned to her home, but the pains continued unabated in the side of the chest. A year afterwards,

August, 1848, being in the village where she lived, I called, and found her much wasted, and suffering severe and frequent paroxysms of pain in various parts of the trunk and extremities, sometimes in one place sometimes in another; sometimes shooting down the limbs, and sometimes like a gnawing in the bones. From her account the kind of pain she suffered resembled that which is occasionally experienced in disease of the spinal cord. There was swelling in the abdomen, and tumours could be felt in various parts of the abdominal viscera. No sign of any return of disease in the palm or axilla. She died in October, 1848. Mr. Metcalfe, the surgeon in attendance, was permitted to make only a small incision into the abdomen. He found the liver studded with white cancerous tumours, having blood infiltrated into some of them.

It is, indeed, remarkable, and contrary to what we usually observe, that the minute seed of so inveterate a disease should have remained lurking in the skin for so many years, causing no symptoms, and producing scarce any structural change. A mere darkening of the colour, and slight hypertrophy of the papillæ of the cutis, being all that was appreciable at the end of ten years; then, without any obvious cause, the part became painful, tumours formed in other regions, the strength failed, and death relieved the patient from her severe suffering. The first trace of the disease, too, it is to be observed, consisted in a mere stain or spot in the skin, caused by the deposit of pigment, (it would almost seem of pigment only,) in the tissue of the cutis. In the case first detailed the disease, that is to say each tubercle, appeared to commence in the same way. This is an interesting feature in melanosis, and it is a question, which the microscope would probably decide, whether in these initiatory stages the pigment does really exist *alone*, constituting the *sole* element of the disease, or whether it is from the very first intermingled with cells and the other ordinary components of cancer. I am disposed to believe that the former supposition is correct, viz., that in melanic cancer the pigment is often first deposited among the otherwise unaltered tissues, and that these tissues subsequently undergo the changes whereby they are reduced to a cancerous condition. In the after progress of the disease, the pigment and the ordinary cancerous elements become blended together in variable proportions, giving to the mass the different shades of colour that have been mentioned. This view is quite reconcilable with the opinion before expressed, that the malignant qualities of melanosis are due, not so much to the noxious influence of the pigment as to the reproductive and decaying tendencies manifested by the other elements with which the pigment is mixed: indeed it would seem from the case last detailed, that so long as the pigment only is present, no destructive changes take place.

Perhaps the pathology of melanic cancer may be thus expressed:—First, some deterioration takes place in the nutritive properties of the tissues, in consequence of which they become infiltrated or impregnated with grains of pigment. This condition may exist for

a few hours, or for many years. It may be attended with scarcely any appreciable change in the affected tissues; it may be associated with hypertrophy of them, as in the case of the woman just related, or with atrophy and degeneration of structure. That degeneration sooner or later assumes the cancerous type; new products are formed, impregnated, like the parent tissues, with pigment, endued with much power of reproduction, and impressed with great tendency to decay, resembling, in short, both in general structure and qualities, those which are found in scirrhus and encephaloma. I do not mean to say that this order of things is invariably followed. Sometimes, no doubt, the pigmentary matter is a secondary product only, being superadded to the other elements of cancer which have been previously developed.

Gelatiniform or colloid, (from *κωλλη*, glue,) cancer, consists of a substance like calf's-foot jelly, or glue, contained in the meshes of a fibrous stroma. The jelly-like substance has commonly a pale or straw colour; sometimes it is yellowish, brownish, or reddish. It is usually clear and transparent, but occasionally it is opaque, resembling curd or honey. Like the corresponding element of the other varieties of cancer it contains nucleated cells in the several stages of their development. The cells present a general similarity to those found in scirrhus and encephaloma, being, for the most part, spherical or oval, containing two or more nuclei, and floating in a fluid which contains nuclei, granules, &c. In some cases the granules and nuclei only can be discovered; and in some the jelly-like substance appears to be quite structureless, containing only a few fine molecules. The tissue of which the fibrous stroma is composed differs, according to Bennett, from that of scirrhous and encephaloid cancer, in not containing permanent nuclei, or affording any evidence of being developed from nuclei or cells, but appearing to be formed by precipitation alone. It is freely supplied with blood-vessels, which often present a beautiful appearance, ramifying in the delicate fibrous septa which enclose the gelatinous substance. The fibrous septa are so arranged as to form loculi sufficiently large to be visible to the naked eye, varying from the size of a grain of sand to that of a pea or nut. They are commonly thick, and tolerably distinct; but in some parts, more particularly near the surface of the tumour, they are very delicate, scarcely or not at all perceptible without the aid of a lens, and the mass then presents a granulated or finely nodulated appearance, very much like gum Arabic.

The gelatiniform cancer presents very much the same general features as the other varieties of cancer. It invades and destroys the natural tissues, and itself undergoes spontaneous disorganization. Respecting the mode in which disorganization takes place there is some uncertainty. Inasmuch as the jelly-like contents of the loculi commonly present the same degree of transparency and softness in every part of the tumour and at every period of its growth, it would seem that the breaking down of the mass must depend either upon some changes going on in the containing stroma, or upon

the jelly-like substance being produced in such quantities as to burst the septa that enclose them. The large quantities of fluid which are not unfrequently found to have escaped into the abdominal cavity from these tumours situate on its wall may be thought to favour the latter view.

The disease is most frequently observed in women, affecting principally the abdominal organs, the stomach, omentum, the ovaries and the peritoneum. It has also been met with in the bones, in the walls of the urethra, the mammary gland, and the uterus. It may form a solitary tumour, or it may be infiltrated into the tissues; and, like the other varieties of cancer, it is often attended, in its early stages, with a hypertrophic condition of the tissue which it infests. Thus, in a case of colloid cancer of the stomach, described by Dr. Walshe, where the morbid structure was chiefly developed between the cellulo-fibrous and mucous tunics, some of the colloid loculi were observed to extend into an elevated production, which consisted of a fold of mucous membrane in a state of hypertrophy. "Hence it appears," writes that author, "that the mucous membrane, previously hypertrophous, may, as well as the cellulo-fibrous and mucous tunics, become the nidus of the diseased formation. M. Cruvelhier has made a similar observation, for he remarks that the fungous vegetations observed in the substance, or in the confines of gastric colloid, are mucous papillæ prodigiously enlarged."

There are no very marked symptoms which indicate the peculiar nature of the disease during life; indeed it has, in most instances, not been discovered till after death. In several cases where it affected the peritoneum, growing quickly and causing great distension, distress and embarrassment of respiration, fluctuation has been felt, and tapping resorted to, under the impression that the disease was ovarian dropsy, or ascites. Nor has the mistake been then always discovered, for in some cases a considerable quantity of fluid which had escaped from the growths into the cavity of the abdomen has been evacuated, and temporary relief afforded.

A cursory examination of these specimens from the museum will give you a better idea of the disease than any description. Its characters are so well marked, that having once seen an example you will be able to recognise it again without difficulty.

Here is a great mass of gelatiniform cancer which originating in the submucous or muscular coats of the stomach, near the pylorus, has burst through and destroyed the mucous membrane to a great extent, so that the granulated surface of the mass is exposed naked in the cavity of the stomach. It was taken from a man aged 40, who had long suffered dyspeptic symptoms and recent jaundice, but no sickness or passage of blood. The tumour had been felt during life, but its nature was uncertain.

The series of preparations which I here show you furnish examples of the disease in several organs taken from the same patient, a woman, aged about 50, who died in the hospital with abdominal tumours. The

lower part of the uterus and the upper part of the vagina are quite destroyed, and their place is occupied by a transparent jelly-like substance, disposed in the cells of a delicate, reticulated, fibrous structure. These cells vary in size, being generally small. The surface of the mass is granulated, the component granules being set closely together, and adherent to one another, without any intervening membrane that the eye can detect, though the presence of a membrane may be inferred from the fact that fine vessels carrying red blood can be seen ramifying between them. In the substance of the mass, near the surface, are several opaque, white, soft, spots, like curd. The surface was covered by transparent viscid fluid. The disease does not terminate quite in a defined manner, for the lower part of the body of the uterus in contact with it is, for about a quarter of an inch, infiltrated with gelatinous granules. The vagina terminates in an irregular ulcerated edge close to the tumour, and small gelatinous granules occupy its substance for a short distance below this. I believe the patient was not known to be suffering under disease of the os uteri during life. In this instance the dissemination of the morbid product among the tissues adjacent to the tumour, and the disappearance of those tissues as the disease advanced, is very clearly shown. It is pretty certain that the process of disintegration was going on at the surface of the tumour; nevertheless the exposed granules are quite transparent, and present the same appearance as the other parts of the tumour.

In this portion of omentum, taken from the same patient, are several gelatinous grains and small, firm, nodulated masses, composed, apparently, of an aggregation of these grains, and looking very much like lumps of gum Arabic. The peritoneum covering the viscera and lining the abdominal walls was generally healthy. There were, however, under the diaphragm several circular or oval slightly-raised patches, about the size of a shilling. They had a peculiar appearance, from the central part of each being pitted, or reticulated, as though interstitial removal of fragments by absorption or ulceration had taken place.

These sections of ovarian tumours, from the same woman, are interesting, because they present, at some parts the appearance of the ordinary cystic disease of the ovary, and at others that of gelatiniform cancer; moreover, they show such a gradation between the two diseases as to prove that, in this case at any rate, there is a very intimate relation between them. So again in this thyroid gland, which was also taken from the same woman, and which presents the ordinary appearance of bronchocèle, the cut surface in some places so closely resembles gelatiniform cancer that I suppose we must allow it to be a specimen of that disease. Unfortunately, no microscopical examination of these specimens was made, so that I content myself with simply alluding to the confirmation they appear to offer of those views of the nature and origin of cancer which I have laid before you.

In the course of lectures which is now concluded it has not been my object to give you systematic instruc-

tion in each of the several diseases that fall under the cognizance of the surgeon, so much as to communicate to you a knowledge of the general principles of the pathology of those diseases, and certain general rules, founded upon that knowledge or suggested by experience, which may be your guide in their treatment. The details of the symptoms and treatment of particular diseases have, with few exceptions, been left to be supplied by clinical instruction and observation. Neither, on the other hand, have I entered into that wide domain of pathology which, to speak in general terms, includes the morbid conditions of the circulatory and excretory fluids—a subject of fundamental importance and of daily increasing interest to the surgeon no less than to the physician—because I am aware that it is very fully brought before you in the lectures of the Regius Professor of Physic.

I have repeatedly had occasion to remind you that disease is but a result of some modification of the natural processes of nutrition; that the presence of fresh materials and the operation of new forces are by no means implied by its existence. However heterogeneous the morbid product may appear, however different its course may be from that impressed upon the natural structures, and however destructive to the neighbouring tissues and to the well-being of the body it may prove, nevertheless its nutrition is conducted on the same plan, and it follows in its growth and decay the same general laws as the normal constituents of the frame. Nay, more, I have endeavoured to give you reasons for believing that the greater number, if not all, the tumours, instead of being “new formations,” as hitherto regarded, are in reality only hypertrophic conditions of circumscribed portions of the original tissues. Should more extensive and more accurate observation prove this view to be correct, much will have been done to simplify our ideas of the pathology of these masses; and when we reflect on the great advances in modern pathology effected by those who have directed attention to the diseases depending upon imperfect nutrition, it is surely not unreasonable to expect that the converse state of nutrition will prove to be highly, if not equally, deserving attention. Accordingly, a very large share of our time has been devoted to the consideration of the two great subjects, atrophy and hypertrophy. I may have appeared to lay too much stress upon them, and to have stretched them a little too far, in forcing them to embrace so many and such various products. But the more I reflect upon the matter the more convinced I feel that the *plus* and *minus æquo* of nutrition are of most extensive influence. Sometimes, indeed, I am almost disposed to think that a more accurate and deeper knowledge of physiology may enable us to arrange all morbid products under one or other of these two heads. To attempt this, however, at present would be giving generalization an undue precedence of investigation, and would savour too much of that tendency to bend facts into an accordance with theory, which is so detrimental to the true progress of science.

ABSCESS IN THE RIGHT LOBE OF THE CEREBELLUM,

WITH CARIES OF THE PETROUS BONE.

By W. BUDD, M.D.,

PHYSICIAN TO THE BRISTOL INFIRMARY.

Read at the Quarterly Meeting of the Bath and Bristol Branch, Oct. 2, 1851:

GEORGE BELL, aged 13, of spare habit and delicate appearance, but never before the subject of serious illness, was laid up in the beginning of June, 1851, with an attack which was at first considered to be one of simple fever. Two circumstances were, however, remarked, which the sequel showed to be of great importance. These were, severe headache chiefly confined to the right temporal region, and a slight discharge from the right ear, with some deafness on the same side.

For the relief of these complaints leeches were applied to the temple and behind the ear, followed by a blister to the same spot. Salines and a few gentle doses of mercury were given internally. Under this treatment the pain abated, the febrile symptoms entirely subsided, and in the course of a few days the boy was able to return to school and resume his usual occupations. The pain in the temple, however, never entirely ceased. It was described as a dull pain, occasionally attended with *throbbing*. Up to this time there had been no vomiting, and no disorder in the motor or other powers of the nervous centres.

On the 12th of June he was again laid up, and on the following day Mr. Tribe, his usual medical attendant, was sent for. The pain of the head had once more become severe and abiding. It was limited still more strictly than before to the right temple, occupying, according to the patient's own description, a space not broader than a crown piece; it was not acute or lancinating. There was still considerable deafness of the right ear, but the discharge had ceased. In addition to this, a new symptom of great significance had made its appearance. Two days previously the speech had become thick and indistinct, and was now, at times so imperfect as to be almost unintelligible. Mental faculties unimpaired; memory accurate; no strabismus; no lateral or other deviation of the tongue; no sickness; pupils somewhat dilated, but equal and sensitive, vision good. No heat of surface; no thirst; extremities rather cold than otherwise; tongue moist but thickly coated; bowels torpid. Pulse about 100 in the minute, weak and fluctuating. Complexion pale; countenance deeply marked with the stamp of suffering.

On the following day it was observed that his gait had become insecure, and in particular that there was some dragging of the right leg. The face, also, was drawn, but to which side was not noted. The pain of the head had extended itself across the forehead, and the patient had become drowsy. He had also vomited several times, rejecting everything as soon as taken, with the exception of milk, which sat well on the