CASES
OF
CANCEROUS OR MALIGNANT DISEASE
OF THE
SPINAL COLUMN,
WITH REMARKS.

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READ FEBRUARY 23RD, 1841.

THE Transactions of the Society contain several cases in which the bones were observed to have become softened, with a deposit of cancerous structure in their interior, so as to break from trifling causes, after having been in most instances affected by pain of a more or less severe character resembling rheumatism.* The neck of the thigh bone has been most observed, when in this morbid condition, but other bones also are liable to be so affected, and among them, those of the spinal column. There are, however, so few well-described examples on record, of cancer or other forms of malignant disease of this important part, that some account of the four following cases may perhaps be, not without value.

* Med.-Chir. Trans., vol. xv. 186., xvii. 56.

Case I.—Sophia Green, æt. 39, was admitted into St. George's Hospital May 7th, 1834, under my care, having enjoyed good health till very recently, when several months' anxiety and fatigue in nursing her husband, who died a few days before her admission, had a good deal affected her ; and during that time a cancerous tumour of one breast, which had been first observed two years previously, had rapidly increased. It was now ulcerated and very painful, with retracted nipple, and thickened skin, and the glands in the axilla and above the clavicle were enlarged, and very hard. She complained however quite as much of pain in the neck, which had begun about two months previously, the pain being in the cervical vertebræ chiefly, whence it extended round the neck and over the scalp, and all these parts were very tender to the touch. She had also a little difficulty and pain in swallowing, and was unable to move her head in any manner without great exertion, and the effort gave her considerable pain. Supporting her head and neck on the right side, as she lay in bed, was very painful, but she could not lie on the left side at all ; probably some stretching of the parts being occasioned by the weight of her head on the pillow. If she tried to change her position, it was done by first putting both her hands to her head to support it ; and pressing the head downwards by the hand occasioned much suffering. The centre of the neck appeared a little sunk forwards, as if the upper vertebræ had been depressed in that position.

The tenderness of the scalp was nearly removed by some small doses of Colchicum and Opium, and the pain in the vertebræ was somewhat lessened by a blister, but the symptoms just mentioned continued more or less till her death.

In the early part of June an immense number of cancerous tubercles formed in the skin around the breast, covering much of the abdomen, and thorax, and shoulder ; and in the latter situation many of them had coalesced, so as to form a hard mass of considerable size. About the same time she began to suffer from obstinate constipation, with frequent vomiting, which continued for nearly the last six weeks of her life, and appeared to arise from a mechanical cause. During this time the breast ulcerated and sloughed extensively, till she was released from her sufferings on the 16th of July.

The breast and pectoral muscles, and cellular texture, formed a large mass of scirrhus tumour, which at one part reached to the intercostal muscles, and a central slough had contaminated the ribs also, two of which were softened by absorption of their earthy substance, and filling of the cells with bloody pulp, so as easily to allow of their being bent or cut. The cutaneous tubercles, and absorbent glands, and the fat surrounding them, were evidently of cancerous structure, and one of the glands contained some bloody purulent fluid. The body of the fifth cervical vertebra was very irregular on its surface, and was softened throughout with much enlargement of the cells of the cancelli, which were filled with a san-

guineous pulpy fluid ; the two adjoining vertebræ showed a lesser degree of the same morbid structure. The uterus was healthy, but both Fallopian tubes were much dilated, and contained a thick brownish fluid ; the ovaria formed two tumours of the size of an orange, and contained several cysts, the larger of which were filled by transparent fluid, the others by an opaque semi-fluid substance. These ovarian tumours were the immediate cause of death, as they filled the pelvis in such a manner as to obstruct the rectum, which lay in the angle between them, upon the sacrum ; and their nature was probably malignant, as several of the lumbar glands were enlarged and pulpy.

In this case the cancerous change of structure was in an early stage, affecting only the cancellous texture, or nearly so, and influencing slightly the adjacent nerves ; but not forming any tumour, and causing no alteration in the functions of the spinal marrow. The next case illustrates the further progress of the disease.

Case II.—Jane Hall, æt. 55, was admitted into St. George's Hospital for paraplegia, and remained under the care of Dr. Wilson for two months, after which she was transferred to my charge, at the end of November 1839. It appeared that the right breast had been removed six years previously for cancer, I believe by Mr. Mayo, in the Middlesex Hospital, and the part had remained well till May of the present year, at which time some cancerous tubercles were formed in and around the cicatrix, and one or

two glands became enlarged and hard in the axilla. She experienced pain in both these parts, occasionally severely, but they did not ulcerate, or undergo any material change during her life ; the spine and the parts below it being the seat of her sufferings, and the cause of her death.

About March last (that is, nearly two months before the return of the cancer in the skin and glands), she began to suffer much pain in the back, chiefly in the dorsal region, and in May she experienced some pricking sensations in the feet, soon followed by numbness and loss of sensation, and in a short time by loss of power over the muscles of the lower limbs, which nearly at the same time became affected by involuntary contractions ; in July the bladder and rectum also became paralysed.

In November, when she became my patient, one spinous process in the back was just enough prominent to be fixed upon as the seat of the disease, but by degrees it projected so as to form an acute angle, with a considerable curve above and below it, the vertebræ being bowed forward somewhat in a semi-circular form. She complained of constant and acute pain along nearly the whole spine, but especially at the angle formed by the sixth dorsal vertebra, and the pain was much increased by pressure about this part, or any where below it, and for a little way above that bone. The angle appeared to arise from loss of substance in the body of the vertebræ, without any apparent swelling around it. The only other local circumstance to be noticed was

that I sometimes thought I could feel a hard tumour in the abdomen, but in consequence of the extreme tension and hardness of the abdominal muscles, excited by any examination, it was difficult to be certain of the fact ; it will appear probable, however, that the diseased state of the omentum, subsequently described, had really been thus felt.

Below the affected part of the spine all the functions of the spinal marrow were materially impaired, or to use her own expression when attempting to sit up, “ she felt as if she was about to drop into two parts.” The physiology of the spinal marrow was therefore so well illustrated by the following interesting pathological symptoms, that perhaps an account in detail may be justified, in a case where the structure of the medulla was wholly unaffected.

First, with regard to *muscular power*. This faculty was totally lost, as to the will, in every muscle of the limbs, or loins, or abdomen, as well as in the sphincters of the bladder and rectum ; but many of them were in an almost constant state of tonic spasm, while there were also occasionally convulsive or clonic spasms in the same or other muscles of the limbs and abdomen. Thus the abdominal muscles were so permanently contracted as to curve the body forwards, and present rigid masses to the fingers, the pressure of which increased their hardness, and painful spasms took place also in them, either by themselves, or at the same time that the limbs were contracted. The hips and knees were almost always in a bent position, the thighs nearly

in contact with the abdomen, and the heels nearly upon the nates, but the limbs also jumped a good deal, particularly at night. The feet and legs did not much participate in this tonic spasm, nor in the occasional convulsions, and their muscles did not act nearly so much from external impressions, such as pressure, or pinching any part of the limbs, or tickling the soles of the feet, which readily excited the actions of the muscles of the hips and knees. The tonic action of the limbs was trifling, so that they could be elongated with very little resistance, and would lie flaccid for a few seconds, after which they would suddenly be drawn up again, and every movement of this kind was accompanied by the most excruciating pain. For about a fortnight on one occasion she was much relieved by having the limbs kept in the extended position by fastening the feet to the foot of the bed, but the spasms which then took place in this new posture became worse than those before experienced, so that she was allowed to have them again at liberty.

The loss of power over the sphincter ani generally caused an involuntary escape of fæces, without consciousness of their passage; the bowel itself was usually weak in its expulsive power also, but now and then there was less constipation, so that, even as late as March, she was sensible of an inclination to empty the rectum, and could voluntarily call its muscular power into action to expel its contents, the sphincter being at the same time paralyzed, with insensibility to the discharge.

The sphincter of the bladder was paralyzed, so that there was invariably an incontinence of urine, but the detrusor never lost its power, so that there was no partial retention, as is so often the case in paralysis. She was at the same time wholly unconscious of the escape of the urine, and had no voluntary power over the detrusor, such as was just remarked to have been sometimes present in the coats of the rectum.

Secondly, the *sensibility* to external impressions was entirely lost in every part below the back, so that she could not feel smart pinching or pricking, or heat or cold, in any part, and was also (as was just remarked) destitute of sensibility about the two outlets of the bowel and bladder. Sometimes she thought she felt a little when pinched in the thighs, but I believe it was only when muscular action was excited by the stimulus. But though destitute of common sensibility, violent pain was caused in every part by spasm, either spontaneous or excited, and she felt severe pain occasionally in the limbs, when no contraction was present, but still more in the abdomen, the pain in which was said to be an agonizing and burning pain, and was almost always complained of, and perhaps depended partly on the morbid changes of the internal parts, which are less dependent than the parietes for their sensation on the nerves passing to them from the spine below the seat of the disease.

The acute pain thus experienced below where the spinal marrow was nearly deprived of its functions

is often called *increased sensibility*, for example, by Dr. Abercrombie, and MM. Serres and Ollivier, in speaking of this subject ; but the parts thus painful being utterly destitute of common sensation, the expression seems to me to be an erroneous one for such acute morbid impressions.

Thirdly, the *temperature* of every part below the disease appeared to be permanently higher than the upper half of the body ; the difference being about four degrees between any two parts, that appeared fairly comparable with each other, after allowing for the warmth of clothing and other circumstances.

Fourthly, the *secreting* properties of the intestines and kidneys were rendered morbid, so that besides the constipation and involuntary escape of fæces from want of muscular power, the evacuations were almost always very foetid and offensive, and generally dark coloured, though in some measure under the influence of mercury ; and the secretion of urine was permanently alkaline. This fluid was, however, pale and clear, and free from mucus or albumen, so that it was not alkaline enough to irritate the mucous membranes of the bladder and kidneys ; nor could it be said (as is generally supposed with regard to the alkalescence of the urine after injuries of the spine,) that the urine became alkaline because mucus was secreted by the urinary surfaces, since the urine was, in this case, always alkaline, though without mucus.

Lastly, the circulation and nutrition of the parts below the disease of the spine were impaired in the

manner usually observed in injuries or diseases of the spine, so that there was from the beginning of 1839 a disposition to the formation of sloughs over the trochanters and sacrum, or in any part in which pressure was made, together with œdema of the legs, and the appearance of bullæ on the skin.

With such symptoms as these connected with the spinal marrow, sometimes a little remitting in severity, but on the whole advancing, this patient lingered on till June 17th, 1839, when the mortification became very extensive on the hips and nates, and was the immediate cause of death, as is usual where the spinal functions are wholly lost or seriously impaired.

It is unnecessary to dwell on what was done to alleviate an evidently fatal malady, but it may be as well to mention that what appeared to afford most relief was an occasional blister to the spine, or a belladonna or opium plaster, and sometimes dry cupping along the back, together with opium frictions on the painfully-contracted abdomen and limbs; and stimulants to the parts whose vitality was much lowered, so as to inflame and slough; with different narcotics internally, particularly the bimeconate and acetate of morphia.

On examination of the spine by removing the spinous processes, all the vertebræ were found to be unusually soft and vascular, and there were seen in the section of several of the dorsal vertebræ spots or tubercles of yellowish white substance, similar to that found in larger quantities in their bodies. On

opening the sheath of the spinal marrow, a little clear water was seen below the arachnoid membrane, but the whole medulla was of its natural colour and consistence, and presented no appearance whatever of inflammation. Opposite to the sixth dorsal vertebra it had been pressed upon by a tumour projecting from the body of the bone, so that a deep sulcus of the entire circle was formed, in which so little medullary matter was left that the central part was almost transparent: the part thus pressed upon was full half an inch in length, though it has contracted by spirit in the preparation.* Even in this point, however, there appeared to have been no inflammation whatever.

Opposite to this part some firm structure without bone projected from the body of the sixth dorsal vertebra in the form of four oval prominences, so as to encroach considerably on the canal; three of these were covered by the dura mater in firm union with the morbid growth, but over the other an opening was formed in the membrane with smooth edges, through which the new growth appeared, the opening being the result of simple absorption without any ulceration. On making the section of the vertebræ seen in the preparation, the morbid growth was found to proceed from these vertebræ, the sixth or central one being most altered in shape, though all three of their bodies were almost entirely con-

* The preparations illustrating these cases, which were shown at the Society, are either in my own, or the Hospital collection at St. George's Hospital.

verted into a cancerous substance ; the sixth having spread out posteriorly, while it was much compressed in front, the fifth and seventh vertebræ almost coming in contact, an acute angle was thus produced, which made the spinous process of the sixth so prominent during life. The projection into the canal was about half an inch beyond the line of those vertebræ which had no external growth ; in several of the other vertebræ, however, cancerous substance had been deposited in the form of tubercles in their cancelli. The new growth was firm, with fibrous structure of a white appearance in bands, with some yellow softer substance in the interstices. Many of the other bones of the body, and the other parts of those in which the cancerous tubercles were seen, were softer and more vascular, and with larger cells than usual, with reddish pulp in their cancelli.

The lungs were healthy, but the pleuræ were every where closely adherent, so as to form a thick layer of very hard substance, which had more the appearance of cancerous membranes than of simply inflamed pleuræ.

The abdomen contained a small quantity of serum, and almost the whole of the peritoneum was covered by small cancerous tubercles, in no part going into any viscus ; they were hard and close set, of the size of grains of wheat, but a few were a little larger. They were most numerous on the diaphragm and small intestines, and many parts of the bowels were matted together by adhesion of these

tubercles, especially about the head of the colon and the ileon. The omentum was changed into a hard scirrhus band about an inch broad, and half an inch thick.

The peritoneal surface of the uterus and adjoining parts was much altered by the tubercular deposit, and in the body of the uterus was embedded a small cancerous tumour the size of a pea.

The axillary glands were of well-marked scirrhus character, with bands going far into the surrounding fat; the cancerous cicatrix and cutaneous tubercles did not affect the muscles below them.

These two cases appear to have been good examples of cancer occurring secondarily in the bones of the spine, and seem to show pretty fairly two different stages of the disease.

I am only acquainted with three recorded cases of cancer or scirrhus, as distinguished from the medullary and fungous varieties of malignant disease. Two of these are briefly alluded to in the published lectures of that distinguished ornament of this Society and of our profession, whose loss we have so recently had reason to deplore.* In one of them scirrhus tubercles were found in the cancelli of several vertebræ after agonizing pains in the back;—in the other, it is remarked that tubercles were found adherent to the spine, I presume not in the interior; the spine is also said to have been dis-

* Sir A. Cooper's Lectures, small edit. p. 349.

torted, and to have caused more suffering than the disease of the breasts. Both these cases therefore resemble the first which I have described : there is, however, a third case which has been published by our president,* in which, as in my second case, the spinal marrow was implicated. In all the five instances cancer of the breast was the primary disease.

In Sir B. Brodie's case several vertebræ were converted into a gristly substance possessing considerable vascularity, without earthy matter, and the whole of the lower part of the three vertebralis was filled with serous fluid. The effects upon the spinal marrow were in many respects different to my case, the lady being suddenly seized, two months before her death, with paraplegia and loss of sensibility below the back, without appearing to have had preceding pain ; nor is pain mentioned as having afterwards been present. She was subject, as Halls was, to involuntary convulsive movements, but these also were unattended with pain ; the patient only complaining that it was disagreeable to see them. The urine in this patient, after being at first clear and natural, became ammoniacal as in Halls, but was also loaded with offensive mucus, and deposited phosphate of lime ; and there was the inflammation and dilatation of the urinary organs usually present when the spinal marrow is seriously affected, but from which latter effects my patient

* Brodie on Diseases of the Joints, p. 283.

was free. As a diagnostic sign of cancer of the spine, acute pain cannot therefore be regarded as *invariably* present, but in all the other four cases it appears to have been most excruciating; I never saw evidence in any other disease of the spine of such exquisite suffering as in my two cases; and as pains have generally been noticed as having preceded fracture of the femur or other bones, when affected with cancer, the practical inference may perhaps be legitimately drawn, that rheumatic pains much complained of in the spine, should usually contraindicate the performance of an operation for cancer of the breast or other organ. In Green's case the acuteness of the pain and tenderness, and the manner in which certain nerves of the head, throat and neck were affected, enabled me some months before her death to anticipate cancer in the vertebræ; and in Halls' case also, the same circumstances, together with the degree, and in some measure the peculiar manner in which the functions of the spinal marrow were interfered with, left no doubt in my mind of there being cancer, although the angular curve made the local appearance not unlike that of caries. The angle was quite acute enough for considerable loss of substance, but the vertebræ above and below the projecting spinous process were a little more curved forwards than is usual in caries, which a little assisted the diagnosis; this circumstance arising perhaps from the softening of the bones, or partly also from paralysis of the posterior spinal muscles.

I could not indeed tell that there might not also be some alteration of structure in the spinal marrow or its membranes, besides that of the bones, (which was rendered certain by the acute angle of the spinous process,) since the symptoms connected with the medulla were such as might be occasioned by any cause that interrupted the communication of the lower half of the body with the sensorium, whether situated within the spinal marrow, or external to it.

Of the treatment of an evidently incurable disease in both cases, it is unnecessary to say more than has already been done.

In all these cases the malignant disease of the spine was secondary to cancer of the breast, and there seems to be no doubt, from general testimony, that although medullary and fungous tumours not unfrequently originate in bone, ordinary cancer or scirrhus on the other hand is at least very rare without preceding cancer of some other tissue. The following case affords an instance of *primary malignant disease* of the spine, which corresponded much more with cancer, in the appearance and symptoms, than with medullary tumour.

Case III.—The subject of this case was a gentleman, seventy-four years of age, who came to town in August last, and was for a few days under Sir Benjamin Brodie's care, after which he was chiefly under the charge of Mr. Keate, with whom I saw

him, and in his absence from town I attended to him, and also examined the disease after death. I am indebted to both my colleagues for permission to make use of their observations of the case in addition to what I learnt myself from the patient.

This gentleman, after sitting near an open window in cold weather, in the spring of 1840, began to feel pain on the left side of the neck, extending from the head to the shoulder, with numbness of the left side of the head. The pain was like that of rheumatism, and never subsided after its first appearance, and in about a month was succeeded by a swelling on the left side of the neck. Both pain and swelling increased, and in July, about four months from its commencement, the pain became more severe and burning, and both pain and swelling extended to the right side of the neck. When he came to town at the end of August, the pain was most severe on the right side, where a spot of the size of half-a-crown, about the middle of the neck, near the vertebræ, was affected with most excruciating pain; the pain every where was severe, but he said he could bear the rest tolerably well, if this part was relieved. I saw him first after he had been nearly three weeks under treatment, (mercury and iodide of potassium, with leeches and cold lotions, chiefly,) by which some diminution of the swelling and of the pain was effected.

In the back of the neck was a good deal of swelling, of a firm elastic character, appearing to be below the muscles, but now and then giving an ob-

scure sense of deep fluctuation ; the swelling on the left side of the spine reached from the head to the level of the fifth cervical vertebra, and on the right was opposite only to the second and third bones, projecting chiefly at the sides, so as to leave the sulcus of the spinous processes in some measure perceptible. This swelling was very tender, as well as painful, without adhesion to the skin, or alteration of its colour. Every attempt to move occasioned very great suffering, so that it was difficult for him to find a tolerably comfortable position for the head to lie on a pillow ; no movement whatever was performed, but by the head with the whole body, and any attempt forcibly to rotate the neck could not be borne for an instant ; pressure on the head downwards produced also much increase of suffering. The pain was constant, but liable to occasional increase, it prevented sleep, and required the free use of opiates.

The tumour at one time lost perhaps a third of its bulk, but this subsequently varied, in consequence of occasional attacks of increased pain and swelling, as if suppuration threatened, and this chiefly on the left side. A blister and an iodine lotion appeared somewhat to increase the tumour, and although it never returned to its former size entirely, yet the pain latterly was almost as severe as ever.

After his journey to town in August, he felt for a day or two a tremulous action of the muscles on the fore part of the thighs, but this did not return.

About three weeks, however, before his death, his left arm became nearly paralysed, and the power over the left leg was slightly impaired, his senses being the whole time perfect.

During most of the time the general health was little disturbed, but latterly he suffered a good deal from salivation, and became thinner and weaker, and thought himself in danger, and during the last three weeks, in the last of which he had severe diarrhoea, his strength gradually failed, in consequence of which Dr. Seymour was consulted, who was present at the examination on the 25th of October, in which I was assisted by Mr. Prescott Hewett.

The swelling was composed of a firm solid tumour, which occupied the place of the third cervical vertebra, and in part the second also, with a considerable portion of the adjacent ligamentous, tendinous and muscular substance, the distinction between what had been of osseous, and what of soft structure, not being clearly perceptible. The new structure occupied the whole of the arches and processes of the vertebræ, and in part their bodies also, so that scarcely any part remained osseous except the processus dentatus, which was by the softening of its base so moveable, that there must have been some risk during life, of its being torn away from its attachment. Some of the new structure had encroached on the vertebral canal on the left side, between the dura mater and the first and fourth vertebræ, the tumour adhering slightly to the membrane ; and within it was a good deal of thin serum,

but the medulla itself was not unusually vascular. The brain also was healthy, with the exception of some serum effused under the arachnoid of the cerebrum.

The tumour was white and lardaceous in appearance, and softest in the centre, where the bone originally existed, which part was also more vascular than the outer part, which had been formed by the softer tissue around the vertebræ; on the left side, where the natural texture of the muscles began to be evident in union with the morbid growth, was a small quantity of dark, bloody pus. In the liver, which was otherwise healthy, were two tubercles of the same white texture as the tumour, but a little firmer, and less lardaceous; one of these was on the surface, and of the size of a walnut; the other was in the interior, and a little smaller. The kidneys and other viscera, both of the abdomen and thorax, were healthy, except that the intestines were blanched by the diarrhœa.

This case differs from the preceding ones in the formation of an external tumour, in consequence of the growth being chiefly in the arches of the vertebræ, instead of their bodies, and in the contamination of the adjoining parts. The same excruciating pain, however, attended this primary disease of the bones, which was present in most of the preceding instances of cancer following malignant disease of other textures. Its malignant nature was evident in the texture of the tumour, and of the tubercles of the liver, and on the whole it appears to

me to have been nearer to scirrhus than to the fungous forms of malignant deposits.

Except, however, the acuteness of the pain, there was no circumstance which marked its character during life at all decisively;—it might have been caries with much chronic thickening of the adjacent parts, and slow suppuration, to which the trifling purulent secretion actually present gave it much resemblance; it might have been disease of the bone, with swelling from scrofulous or tubercular deposit, though the age was against it; or it might have been like a fatal case of organized deposit (from rheumatic inflammation likewise) related by our president,* which does not seem (as the preparation shows) to have been either tubercular deposit or malignant matter. Some suspicion of its real nature was sometimes entertained, but the case was confessedly too obscure for any one to pronounce a positive opinion.†

* On the Joints, p. 309.

† It appears to me that some of the cases occasionally published as instances of malignant disease of the spinal meninges, or other parts around, are really instances of scrofulous or tubercular disease, or of simple organized deposit, like those above referred to. See, for example, the excellent article recently published on cancer in the *Cyclopædia of Surgery*, in which Dr. Walshe quotes as an example of "Encephaloid growth protruding externally from the spinal canal," a case of Dr. Knox's, (*London Medical Observer and Enquirer*, Vol. 3, p. 160,) in which, however, the author himself describes the two bodies in question as being, one like a scrofulous gland, and the other as bloody pus, and which therefore I should regard as not being of malignant character. The truth

Case IV.—The next case differed materially from either of those previously described, in the age of the patient, and in the origin of the disease, as well as in the appearance of the tumours. The subject of it was under Sir Benjamin Brodie's care in St. George's Hospital, who has kindly allowed me to relate its history, for some particulars of which I am indebted to Mr. Tarrant, our present house-surgeon, who was then Sir Benjamin's clinical clerk; but I also saw the child repeatedly during life, and was present at a careful *post mortem* examination, which neither of those gentlemen witnessed.

Charles Gilson, æt. 4, was admitted October 30, 1839, with a firm inelastic tumour, distending the left nostril, of a reddish ash colour, which was attached to the outside only of the nostril, the skin and cartilage being much distended, and the tumour beginning to spread over the jaw under the muscles. It had begun about four months previously, in consequence of a blow, which had caused considerable hæmorrhage, and the tumour, which had been of late increasing more rapidly, had bled repeatedly. The general health was as yet unaffected, and therefore, although the disease was evidently malignant, it was determined, on consultation, that the tumour should be removed, together with as much of the maxillary bone as appeared to be implicated. In

is, however, that all verbal descriptions, and even many drawings and preparations of morbid structures, convey very imperfect ideas of their nature to those who have not themselves been witnesses of recent appearances.

the operation, it seemed probable that it did not protrude from the antrum, and Sir Benjamin therefore contented himself with destroying, by means of chloride of zinc, all the surface to which it was attached. The section of the tumour shows a firm gristly or half cartilaginous texture, with a slightly reticulated appearance in the centre, where it was most vascular.

From Nov. 9, when the operation was performed, till the end of January following, when the child left the hospital, the health continued good, and there was only, as it appeared, some dead bone to exfoliate. On February 19, however, he was re-admitted, looking pale and anxious, and scarcely able to move any of his limbs, in which much pain was felt. The abdomen was large and tender, there was a good deal of fever, and the nostril was full of tenacious mucus, with some coagulated blood. It appeared that he had had a fall a fortnight previously, since which his nose had bled profusely on several occasions, and he had rapidly declined in health, and the right hip, on which he was supposed to have fallen, was painful and tender.

After his admission, the paraplegia increased, as to the muscular power, but the sensibility was not lessened, nor was there any sloughing of the lower part of the body ; and somewhat later there was incontinence of urine and fæces.

Some bleeding continued to take place from the nose, with sloughing of the cheek, by which a large part of the maxillary bone was exposed, and its

vitality destroyed, and in March, some glands behind the left ear enlarged considerably, and a tumour was felt at the extremity of the sternum. The general strength gradually declined, with much irritation from the gangrene of the face, and the child finally sunk on the 12th May 1840, but without any loss of mental power.

The parts about the head had undergone much alteration ; the maxillary bone was softened in the interior, and the antrum filled with soft medullary matter ; the æthmoid and sphæmoid bones were similarly changed, as well as the dura mater lining them, and the cells were obliterated by the morbid structure. Some new growth occupied the sphæmoid fossa, and a portion coming into contact with the periosteum under the zygoma, the disease of the outer membrane had produced a hole through the temporal plate of the sphæmoid bone, so as to project through it into the cranial cavity. The brain itself, however, was healthy.

The tumour at the end of the sternum had been formed all round the ensiform cartilage and adjacent bone, the cartilage itself being unchanged in the midst of a solid semi-cartilaginous mass, of the size of a large walnut, and of a yellowish white colour. A great many similar tumours existed in many other parts of the bones, which were almost every where confined to the periosteum, so that they could generally be easily separated from the bones by tearing off their investing membrane ; the largest of these was on the inside of one ilium,

and was three or four inches in diameter. They were most numerous along the front of the vertebræ, and on the ribs; and sections of the dorsal vertebræ showed that in several of these bones the new structure had spread into the cancellated texture, the outer shell being absorbed; and in the osseous tissue, as in the cells of the nose, the morbid growth was diffused and softened, so as to resemble medullary tumour, while all those of the outer part of the bones or cartilages were firm, and like fibrous cartilage in appearance; the intervertebral substances were wholly unchanged. Much new growth had also spread between all the processes of the vertebræ, and several masses of some size were formed on the posterior part, and, in one section, the dura mater was thickened by new growth, but smooth on its inner surface. The appearance of the medulla spinalis in its recent state was unfortunately not observed; as far as can be observed, however, in its present condition, when hardened in spirit, it seems to have been irregularly pressed upon by the morbid growth within the spinal canal, but not to be otherwise altered in texture.

The vertebræ most affected were those of the back, which have been preserved; and from the tumours in front of these bones, a great mass of similar hard or cartilaginous appearance, and apparently of globular portions united, projected forwards in the centre of the chest, whence it extended into the root of each lung, the texture of which was thus mixed with divided portions of the general mass; and in some parts towards the circumference of the

lungs, and under the pleuræ, were separate tubercles of similar hardness and appearance to those in the periosteum. No tubercles were observed in any of the other viscera ; but the number existing on all the bony parietes of the abdomen accounted for the fullness and tenderness of that part during life.

In this case the exact origin of the morbid structure in the nose cannot be determined, whether it were in the mucous membrane, or in the periosteum, or osseous tissue ; nor, indeed, whether it began in the nostril or in the antrum. From the healthy structure of the mucous membrane around the tumour, and from the periosteal origin of the tumours of other parts of the body, I am inclined to believe that the periosteum of the maxillary bone was the primary seat of the disease, and perhaps it may have begun nearly at once both in the nostril and antrum, as it did in both surfaces of some of the other bones, and as it often does in what are called malignant polypi.

Although hard and cartilaginous, the tumours had not the usual appearance of the scirrhus or common cancerous form of malignant disease which is so seldom found at such an early period of life ; their fibrous and semi-cartilaginous appearance may be accounted for, perhaps, according to the usual laws of morbid growths, by the tumours having originated in the fibrous tissue of the investing membranes of the bones and cartilages of a young

child. The morbid structure in the softer mucous tissues of the nasal cavities, where the less resistance would make it increase more rapidly, has, however, the common tissue of medullary tumour of such parts. If, then, the whole disease be regarded as of this type, the great contrast it affords to the tortures of the preceding cases in the nearly entire absence of pain in the vertebræ of this child, and in the other tumours which were perceptible, will be in accordance with what is usually observed in scirrhus and medullary diseases, compared with each other previously to the changes of ulceration. The acute pain in the limbs in this case, as was observed in the preceding cases, is not a diagnostic sign of malignant disease in the back, but only of pressure or irritation of the spinal marrow, from whatever cause it may arise; so that the cause of the paraplegia was rendered probable only by the existence of other tumours elsewhere.

I am inclined to think, from scattered notices, that encephaloid and hæmatoid varieties of malignant disease may be more frequent than scirrhus forms of morbid structure in the vertebræ, although I have only the last case to relate upon this subject. For example, in the Museum of Guy's Hospital are two instances of fungoid disease, in one of which the lumbar vertebræ are said to be crushed and affected with this morbid change in consequence of a violent effort, and in the other several of the dorsal vertebræ, as well as many of the other bones of the body, had tumours of this character formed in

them, which implicated the medulla spinalis and its membranes, and induced paralysis.* Again, in a case published by Sir B. Brodie, in his work on the Urinary Organs, he has informed me that there was malignant disease of the spine of this character, although it is not there alluded to.

If, however, we exclude those cases in which the authors themselves express doubts of the nature or origin of the disease, or in which a careful perusal leaves uncertainty as to these points in the mind of the reader, it will be found that there is an equal dearth of well-described cases of the other forms of malignant tumours of the vertebræ, as there is of the scirrhus form.

Malignant diseases having only been clearly distinguished in recent times, it is only in modern works that we can expect accounts of such cases; but of modern works professing to treat of the diseases of the spine, no one alludes to the subject except Sir B. Brodie, in the case of cancer already quoted; and in works which treat of the affections of the spinal marrow, such as Ollivier, Serres, Abercrombie, and others, no satisfactory case is detailed. Dr. Abercrombie indeed remarks, that "fungoid disease of the spinal cord occurs in connection with disease of the vertebræ," and says that several cases of the kind are related in Ollivier. In reality, however, Ollivier's work only contains three cases in which fungous disease, partly affecting the bones, was supposed to exist: in the first of these, which

* See Catalogue, Nos. 1,037, 1,038, 1,027, &c.

is quoted from Serres,* the deposit on the dura mater, with slight alteration of the vertebræ, was probably scrofulous; “semblerait se rapprocher de la matière tuberculeuse ramollie” is the expression of Serres himself. In a second case quoted from Wolf,† a child, ten years old, after a fall, had several vertebræ affected with medullary disease, forming external tumours in the back and loins, with paraplegia. And in a third case, quoted from Lecat,‡ several lumbar vertebræ were converted in part into a malignant growth, in a man who had also met with a fall, and the patient died two days after an unsuccessful attempt to extirpate the tumour.

These cases, however, have been classed by Ollivier§ and by Dr. Walshe,|| among the cases of medullary disease of the spinal meninges; although I think it just as probable that the morbid growth may have originated in the bones, and spread secondarily to the membranes of the spinal marrow, as in the case I have related. Such may also have been the fact in a case related by Phillips,¶ and quoted by Dr. Abercrombie as medullary disease of the spinal meninges, in which a boy of fourteen, three years and a half after a fall, was attacked with violent pain in the back, thighs and legs, followed

* Journal de Physiologie Exper., Juillet 1825.

† Bull. des Sciences Med. de Ferussac, Janvier 1826.

‡ Traité de l'Existence du Fluide des Nerfs, &c.

§ Ollivier Traité de la Moelle Epinière, pp. 490, 737, 745.

|| Art. Cancer, Cycl. of Surgery.

¶ New London Medical Journal, vol. i.

by paraplegia, with a tumour of large size in the loins, subject to frequent hæmorrhage; besides the medullary tumour, said to have originated in the cord, several of the vertebræ are also said to have disappeared with softening of the sacrum and ilium, as well as of those bones.

These three cases may therefore have been medullary disease of the bones in the first instance, spreading to the dura mater, which I have no doubt was the cause of the disease in the fourth case I have related; but besides these instances, of which a different view is taken by the authorities I have alluded to, I only know of two good cases of this fungous form of malignant disease of the vertebræ which have been published, both of which are to be found, with plates of the disease, in Cruveilhier.* In one of these cases, a woman, forty years of age, came under notice, with enlargement of the abdomen; and a very large cancer, as he calls it, (doubtless fungous disease,) of the breast. Three or four months afterwards she was again brought to the hospital in consequence of fracture of the middle of one thigh bone, and while this was being bandaged, the upper part of the other thigh also broke, and she died in the following week. The drawings of the diseased parts show several white tubercles, apparently medullary disease, in the cancelli of both thigh bones, in many places besides those which had broken; and numerous tubercles in the vertebræ, which were chiefly in their interior, but some had

* *Livraison*, xx. pl. 1.

made their way externally by absorption of the shell. It does not appear, however, from the history, that the spinal marrow was in any way affected. There were also tubercles in the cranium, some in the diploë, some raising the dura mater only, and others both dura mater and pericranium. The liver contained a multitude of tubercles, and so also did the pleuræ and peritoneum. The tumours are said to have been white and resisting, with much cancerous juice in their composition.

Cruveilhier's second case was in a young man of twenty-seven, whose testis was removed for medullary disease, six months after which he was seized with acute pain in the sides of the chest, and difficulty in raising his arms, then with pains in his shoulders, and afterwards palsy of the lower extremities. There was an encephaloid tumour of the seventh dorsal vertebra, which was entirely destroyed by it, as well as part of the sixth vertebra, the intervertebral cartilage between them being unaffected, and a tumour of the same kind was commencing in the fourth vertebra, and in the posterior extremity of the first two ribs. No disease was found elsewhere, and the condition of the spinal marrow is unnoticed.