MALIGNANT PAPILLARY DERMATITIS OF THE NIPPLE AND THE BREAST-TUMOURS WITH WHICH IT IS FOUND ASSOCIATED.*

ILLUSTRATED BY SPECIMENS EXHIBITED IN THE PATHOLOGICAL MUSEUM OF THE BRITISH MEDICAL ASSOCIATION AT CAMBRIDGE.

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I AM indebted to Mr. George Lawson for the opportunity of investigating another case in which the appearance described as "eczema of the nipple" preceded the development of a cancerous tumour in the mammary gland.

The patient,† a widow, aged 52, had been four years under treatment for the so-called eczema. Mr. Lawson, who examined the breast in the summer of 1878, after the skin-affection had lasted three years, satisfied himself that there was at that time no breast-tumour; but when he next saw the patient, in July 1879, a year afterwards, a tumour of considerable size was detected. The breast was then removed.

The diseased portion of skin was oval in form, and had a distinct well-defined border. It measured two inches and three-quarters in its long, and two inches in its short diameter. The nipple, which was small and depressed, was situated excentrically in the oval.

The diseased area was rough, and covered with uneven epidermis; the roughness almost amounting occasionally to a warty condition. The border of the area was raised, and at some parts it distinctly overlapped a slight sulcus which formed the line which separated the healthy from the diseased skin.

Microscopical examination showed a condition of the skin similar to that which was observed in Mr. Morris's case. In the diseased area, the epidermis was broken up, but still existed as a covering for the cutis. As compared with that of the adjacent sound skin, the epidermic membrane was thicker towards the border of the area, the interpapillary processes having become longer and broader than in the normal skin of this part. The cells of the rete mucosum were found in various degrees of degeneration; and many of them had disappeared, leaving a vacuole in their place. A fairly compact thin border of the horny layer covered this broken-down Malpighian layer. The diseased rete was sharply defined towards the healthy epidermis by a groove which corresponded to the sulcus seen in the skin of the breast, the degenerative changes extending to the border of the groove. The deep broad mass of epidermis, which separated the healthy from the diseased area in Mr. Morris's case, did not exist in this one, at the part which was examined.

The bundles of connective tissue in the *pars reticularis corii* were normal; but, in the *corpus papillare*, changes similar to those described in Mr. Morris's case were found. The fine bundles of the papillary layer must have been to a great extent destroyed as their place was occupied by a dense mass of exudation-cells. (Fig. 13.) Towards the healthy

Fig. 13.—Showing the condition of the skin in Case 2; magnified 45 diameters.

a. The epidermis, its integrity being broken by vacuoles and disintegrated epithelium. b. A dense mass of exudation-cells taking the place of the connective tissue of the papillary layer. c. The connective tissue of the *pars reticularis corii* in a healthy condition. d. Blood-vessels. e. Bundles of involuntary muscle.

* Concluded from page 763 of last number.

† For a more complete clinical account of the case, see Mr. Lawson's paper in the *Clinical Transactions*, vol. 13, p. 37.

skin, this mass became less dense, connective-tissue elements being mixed with the cell-infiltration. In the diseased or nipple-border of the part I examined (which was from the external portion of the area), this cell-mass touched the broken epidermic cells of the rete mucosum on the one side, and the large, strong bundles of the *pars reticularis corii* on the other. Some of the vessels in the *pars reticularis* and in the papillary layer on the healthy side of the groove were surrounded by a narrow zone of exudation-cells; but in neither of these situations were cells found between the bundles.

The epidermis over a small portion of the nipple which was examined showed similar changes to those found in the areola.

Fig. 14.—Showing the formation of masses of cancerous epithelium in duct cancer of the breast by increase of the normal epithelial elements of a lobule; magnified 30 diameters. a. Section of a terminal vesicle of an acinus of the normal size. The larger columns and circles in the lobule represent the increased size produced by diseased epithelial development. b. Duct through which the impetus to morbid epithelial development has been conveyed to the epithelial elements of the acini of the lobule. c. Large epithelial mass formed by fusion of smaller masses, and by subsequent growth on the circumference. d. Deeply stained curve of connective tissue, foreshadowing increase in the epithelial growth.

This mammary tumour was formed by an epithelial growth which had the following characters. The connective tissue of the nipple

was permeated by numerous epithelial columns, mostly several cells thick, almost up to the epidermis. The hard centre of the tumour contained a dense epithelial growth lodged in alveoli; but it also contained epithelial elements arranged in the same manner as those found on the borders of the tumour. It was on the deep edge of the growth, where normal epithelial elements were still found, that a special examination was made, in order to determine the precise relations of the morbid epithelial development to the lobules of the gland. The epithelial growth in this situation, in its final stage, consisted, as seen in sections, of large circular masses of cells. (Fig. 14.) These masses were surrounded by connective tissue, with which they sometimes seemed to be in direct contact; but sometimes a thin membrana propria intervened between the connective tissue and the epithelial elements. Sometimes one unbroken circle was found alone in the midst of apparently unchanged connective tissue; sometimes a group of three, four, or five such circles were found closely associated. Sometimes, again, a circular bud was found close to a mass; its origin in such cases being explained by sections in which the bud was found connected by a pedicle with a large circle. The features of these groups by which the special character of the tumour is shown are the circular form of the cell-masses, which was comparatively seldom interfered with by epithelial offshoots; the absence of infiltrating epithelial growths in the surrounding connective tissue; and the comparative absence of inflammatory or irritative changes. (Fig. 15.)

Fig. 15.—Showing the rounded form of the growing cell-masses in some parts of the tumour, and the manner in which a tube is produced by breaking down of the central cells of the growing column. (That this appearance does not point to a normal distended duct was shown by the fact, that it was one of a group, all the members of which were close together, and nearly of the same size.) Magnified 265 diameters. *a*. Connective tissue. *b*. Membrana propria surrounding the growing epithelial column (therefore formed *pari passu* with the epithelium). This part of the tumour had the structure to which many pathologists apply the term "adenoma".

The nature of the epithelial element was further illustrated by a special tendency occasionally shown in its development. In some of the round masses, the border-cells were formed by a typical columnar epithelium. (Fig. 16.) The peculiar columnar form of the cells must

Fig. 16.—Showing columnar epithelium (with subcolumnar cells) formed on the outer border of a growing cell-mass. (Typical of duct-cancer, the impetus to the formation of columnar epithelium being derived from the columnar epithelium of the ducts in which the morbid changes began.) Magnified 265 diameters.

be attributed to inheritance of the developmental character of the lining epithelium of the lactiferous ducts, as distinguished from that of the secreting cells of the mammary gland.

The origin of some of the spherical masses of cells by a further extension of the adjacent newly formed cell-conglomerations was directly observed; but no less was a primary and other mode of development a matter of direct observation. In this tumour, the development of cancerous epithelial masses from the small or terminal lactiferous ducts could be traced in all its stages. The first stage was the dilatation of the duct of the lobule, attended by the formation of cells in its walls and in its cavity. The dilatation extended downwards until every vesicle had become a tube formed by a double layer

of cells; the circle seen in section being twice to three times that of the normal vesicle, the outermost ring of cells resembling in size and arrangement the cells described as subcolumnar in columnar epithelium. In some lobules, the growing cell-columns were more or less solid; whilst, in an adjoining lobule, the development of the epithelial border was attended by a corresponding disappearance of the cells in the centre, giving rise to a group of cystic cavities lined with epithelium (Fig. 17). We have thus, in the same tumour, two modes of epithe-

Fig. 17.—Showing the formation of cystic cavities lined with epithelium in a lobule of the mammary gland in duct-cancer (in some lobules in the same tumour all the growths remaining solid). From Case 2. Magnified 30 diameters. *a*. Dilated vesicle, in which the remains of the newly formed cells are still present in the cavity. *b*. Cystic cavity lined with epithelium, the central cells having disappeared.

lial development, each of which is sometimes found exclusively in a breast-tumour, but neither of which is found in parenchymatous (scirrhus) cancer.

CASE III.—An instance in which a superficial affection of the nipple was followed by a tumour in the breast has been brought under my notice by Mr. Alan Reeve Manby of East Rudham. The patient had always had trouble with the nipple when suckling, the last two or three babies getting "as much blood as milk". In August 1876, what Mr. Manby describes as "the superficial ulceration" caused the patient so much uneasiness as to lead her to seek his advice. At that time, the skin "used to scab and heal". In the spring of 1877, she first noticed a lump, which he removed on April 22nd of that year. At the time of the operation, the woman was forty-seven years old; and the catamenia, though irregular, had not ceased. She died in July 1879, with obscure symptoms of general pain, traceable, Mr. Manby believes, to the fear of a second operation he had suggested some months before her death, for the removal of a line of cancerous nodules recurring along the old cicatrix.

The tumour had been preserved in spirit, and was sent to me by Mr. Manby. On cutting through it, I found that the growth had a circular form, the centre being under the nipple. It had a breadth of about three inches, and a thickness of six-eighths of an inch. It was of a pale pinkish colour, permeated by a network of white streaks of connective tissue, continuous with the connective tissue surrounding the tumour. The pinkish tissue contained a great number of minute cavities, the largest being about the sixteenth of an inch. The cavities were the sections of canals or tubes, which admitted a bristle for some distance. Some of the cavities were empty; others were filled with a plug or mould of the same colour as this part of the tumour. A section through the nipple, which was of the full size, revealed the fact that several lactiferous ducts were filled with the same pinkish substance.

Microscopical examination showed that the surface of the nipple was covered by a ragged, broken-down epithelium, similar to that described in Mr. Morris's and Mr. Lawson's cases. Beneath the epidermis there was also, as in these cases, a dense small-cell infiltration,

with partially destroyed connective tissue, large spaces being found between the disintegrated bundles. These changes, which were limited to the epidermis and the papillary layer, were continued only for a very short distance to the skin of the areola, and gradually shaded off into the healthy tissues. The tumour was formed by tubular epithelial growths. (Fig. 18.)

Fig. 18.—Showing the tubes filled with epithelium which permeated the tumour in Case 3; magnified 14 diameters. *a*. Cavity left by disappearance of the epithelium. *b*. Large tubular cavities filled with epithelium.

The tubes grew in clusters, and were formed by the coalescence of the smaller tubes which formed the cluster. In the least advanced clusters, each small tube was surrounded by connective tissue (Fig. 19).

Fig. 19.—Showing the early formation of the epithelial masses in Case 3 by the enlargement and coalescence of tubes and vesicles; magnified 45 diameters. *a*. Enlarging tube filled with epithelium. (The intralobular connective tissue between the round epithelial structures was densely infiltrated with exudation cells.)

In those which were more advanced, the connective tissue within the zone of growth was partially or nearly entirely obliterated—the contours of the small tubes being, however, still distinct. In the most advanced stage, the area of the cluster was either filled with a rounded mass of cells or was found empty, the boundary being formed by an even-contoured ring of connective tissue.

These appearances lead me to believe that the growth was another example of the class of tumours to which, in consideration of the epithelium from which they spring, the term *duct cancer* may be appropriately applied.

CASE IV.—I showed at Cambridge a section from another tumour excised by Mr. Morris, which had been also preceded by this affection of the nipple. An account of the case was read before the Medical and Chirurgical Society on December 10th, 1879. (See *Medico-Chirurgical Transactions*, vol. 63, page 38.) The patient, a woman aged 40, and the mother of children, had suffered from the disease of the nipple for six years before anything was felt in the breast.

This tumour was examined by Dr. Goodhart; and, as a full report by him on its structure is contained in Mr. Morris's paper, it is unnecessary for me to describe it in detail here. As, however, Dr. Goodhart had been so good as give me a portion of the tumour, preserved in spirit, from which I had prepared the section shown at Cambridge, and as it is of some interest to bring together an account of the four tumours, Figures 20 and 21, representing drawings made from one of the sections, are added to this paper.

The sections show lobulated areas of epithelial growths in the connective tissue. In these lobules, all the stages of the formation of epithelial tubes or cysts, which I have described in connection with the previous

tumours, were observed, and are shown in Fig. 21. The larger tubes, formed by the coalescence of the smaller ones, were sometimes found full of agglutinated epithelium, and were sometimes seen as spaces lined

Fig. 20.—Showing the outlines of the areas of cancerous epithelium in Case 4; magnified 14 diameters. *a*. Cavity left by the disappearance of an epithelial mass of new formation. *b*. Contour of the epithelial area (sharply marked off from the surrounding connective tissue which contains no cancerous infiltration). *c*. Connective tissue of the breast.

by a single layer of cells. In the latter case, the epithelial debris had probably fallen out in the preparation. The drawings are sufficient to show that this tumour is not an ordinary scirrhous (parenchymatous)

Fig. 21.—Showing the mode of formation of the epithelial areas from the normal epithelial elements of the breast in Case 4; magnified 45 diameters. *a*. Section of a vesicle of an acinus of the mammary gland of the normal size. *b*. Enlarging tubular structures containing newly-formed epithelium. *c*. Cavity lined with epithelium, formed by the disappearance of the epithelium from the centre. (The rounded form of all the epithelial growths, and the absence of diffuse cancerous infiltration in this case, are characteristic of duct-cancer.)

cancer. I believe that it belongs to the same class as the first three cases. An examination of a portion of the diseased skin, which Dr. Goodhart was kind enough to give me, showed similar appearances to those described in the three preceding cases.

The microscopical examination of the skin in these four cases has established one point of great practical importance. The patients suffered from an affection that has hitherto been described as eczema of the nipple. The diagnosis of eczema from the purely clinical side was, I believe, a fair subject of discussion; but I have never been satisfied that the evidence in favour of eczema was convincing. In two cases of the disease, which I have had an opportunity of examining before operation, the clinical evidence was, in my opinion, against eczema, and in favour of an infiltration in the superficial layer of the cutis. The microscopical examination is decisive on this point, and proves definitely that the disease is not eczema—the connective tissue in eczema, even in the most severe cases, remaining undestroyed.

The publication of this evidence, in sufficient detail to afford a basis for independent judgment, becomes, therefore, a matter of the first necessity; and, in writing this paper, and in selecting the drawings, I have kept this object in view. Full evidence of the kind, with a detailed account of additional cases, was much to be desired. Instances of the disease are not numerous; but it is to be feared that confusion will arise as regards this affection and true eczema of the nipple. Cases have already been published of a speedy cure of the disease, which there is no reason to believe were anything more than simple eczema. When it is considered that the diagnosis of this malignant dermatitis

would immediately raise the question of operation—whilst, so far as we know, a true idiopathic eczema need not—it is evident how important it is to collect all available data which may render the recognition of the difference between the two conditions more easy.

The idea that cancer might develop on long-standing eczema has, analogically, much to recommend it. There are well-known authenticated cases of the development of epithelioma in lupus tissue; and the development in cicatrices, and in tissues subject to special causes of irritation—as in the chimney-sweep's cancer, and in cancer of the lower lip in smokers—is well known. All that is wanting to establish a similar fact for eczema is a well-authenticated case; but, common as eczema is, such a case does not seem to have occurred.

In distinguishing, clinically, this malignant dermatitis from eczema, the chief points to be borne in mind are the well defined margin in the former, and the evidence, when the tissue is grasped between the fingers, of infiltration in the papillary layer. An eczema of the areola, that had the thickening and moist redness which have characterised some of the cases of this affection, would be so acute in its nature that the zone of inflammation would pass off gradually into the surrounding skin, would probably become widespread, and would give rise to very active symptoms. The overlapping margin forming a veritable ridge, with a sulcus behind it, which characterised another case, would of itself be sufficient to exclude the diagnosis of eczema. The history of the case may be found useful in establishing the diagnosis. In two cases which have come under my notice, there was clear evidence that the disease began in a position corresponding to the openings of the lactiferous ducts, and remained limited in that position for some time before extending over the surface of the nipple.

This malignant dermatitis has neither the symptoms nor the pathological anatomy of any known skin-disease. It is characterised by destruction of connective tissue, and by a permanence of the destructive influence; for repair of the destroyed elements does not occur. In other words, a destroying agent extends from the mouths of the lactiferous ducts into the surrounding papillary layer. The condition of the breast, in the early stage before a tumour can be felt, requires further investigation. In a case, examined and described by Mr. Butlin, in which the breast was removed (*Medico-Chirurgical Transactions*, vol. 59, page 103) simply on account of the condition of the skin, there "not being at the time of operation any evidence of cancer", the lactiferous ducts were found, "for an inch or more beneath the nipple", completely filled with epithelium. But, from what we know of the slow changes that frequently mark the earlier stages of cancer of the skin (in rodent cancer, for example), there can be little difficulty in accepting it as probable, that cancerous changes are developing in the ducts long before they have given rise to sufficient induration to produce a palpable tumour.

Irreparable destruction of connective tissue of the areola argues, of necessity, in favour of the continued action of a connective tissue poison, if the term may be allowed. Cancerous epithelium—as distinguished from normal epithelium—is such a poison: and the development of malignant papillary dermatitis of the nipple is suggestive of the escape of fluid through the mouths of the ducts, possessing the corrosive qualities which such an epithelium would give it. The hypothesis is confirmed by the subsequent development of palpable cancerous growths in the breast, which are formed by an abnormal development of duct epithelium.

What I believe is most clearly shown, by the preparations and drawings, regarding the nature of the breast tumours, is, that these cases are not cases of ordinary scirrhus or parenchymatous cancer. In all of them the tendency of growth was in round columns, which as they grew larger coalesced into round masses, the tendency to penetrate and infiltrate the interlobular connective tissue being comparatively feeble. In scirrhus or parenchymatous cancer, the terminal vesicles of the acini, after they begin to enlarge, rapidly lose their symmetry, and offshoots pierce the connective tissue in all directions. In the tumours which I have been describing, on the other hand, the tendency was to regular symmetrical growth on the circumference, and occasionally to the formation of cystic cavities, by simultaneous breaking down of the central cells. The tendency was more or less pronounced towards the formation of structures that, in England, it is usual to describe as examples of adenoma. In Case 11, for example, in some parts of the tumour the epithelial growths consisted of parallel columns (seen in section as groups of circles), one of which is illustrated in Fig. 15. A tumour in which the growths were found of this character, and in which, as was the case with some parts of this one, a membrana propria was found enclosing the new epithelial formations, would certainly be considered by many pathologists as "adenoid". The cases described in this paper support the view, that, between duct cancer (fibro-carcinoma cysticum mammae, Waldeyer), of which they are examples, and the mammary growth known

in England as adenoma, the difference is one of degree and not of kind. When an epithelial growth in the mamma takes its origin in the duct epithelium, if the development of columns and tubes is localised and encapsulated by a growth of connective tissue, the ordinary adenoma is produced; if, on the other hand, there is progressive destruction of connective tissue and continued growth, we have a duct cancer as the result. But the stamp of origin in the duct epithelium is always retained; and in some parts of the tumour round-cell masses, with columnar epithelium, will eventually be found, marking the radical distinction between this kind of tumour and scirrhus or parenchymatous cancer.

The evidence regarding the nature of the breast tumours associated with disease of the nipple, which has been brought forward in this paper, should be taken in connection with that given in Mr. Butlin's papers in the *Medico-Chirurgical Transactions* (vol. 59, page 107, and vol. 60, page 153). Setting names aside, and examining the drawings with which Mr. Butlin has elucidated his memoirs, I believe evidence will be found that the tumours he has examined, and those which I have described, belong to the same category. In Figures 8 and 10, plate 6, vol. 59, and Fig. 4, plate 7, vol. 60, I recognise the structure of duct cancer. The appearances figured are similar to those found in my own cases, and are essentially identical with those described by Waldeyer as characteristic of his fibro-carcinoma cysticum mammae. The blocking up of the lactiferous ducts in this affection, by newly-formed epithelium, is clearly described in Mr. Butlin's paper. Further investigation has, however, shown that the cancerous epithelium may break through the wall of the duct into the connective tissue of the nipple; and that the diseased skin has pathological characters irreconcilable with the conception that the affection is eczema.

In the portion of Dr. Thin's paper published in last week's JOURNAL, Fig. 6 was accidentally reversed. It should have been put thus.

Fig. 6.—Showing a transverse section of a lactiferous duct and columns of cancerous epithelium growing in a direction parallel to the long axis of the duct; magnified 22 diameters. *a*. White fibrous tissue of the nipple. *b*. Elastic layer of Henle surrounding the lactiferous duct; *c*. Contour of the duct. *d*. Column of cancerous epithelium cut transversely.

ON THE ETIOLOGY AND TREATMENT OF LACERATIONS OF THE CERVIX UTERI.*

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HITHERTO no surgeon has given any special attention to the immediate treatment of laceration of the cervix; but quite a number in the United States have made studies in the description of the indications for, and methods of, the operation, for the restoration of a laceration long after the lying-in period. It was my province to first describe the operation, as performed by myself in 1866, when I believed myself to be the pioneer, in a paper entitled *Fissure of the Neck of the Womb*, and published about that time in the *St. Louis Medical and Surgical Journal*. I had been preceded, however, by Dr. Thos. Addis Emmet, the then chief surgeon of the New York State Woman's Hospital, who first performed the restorative operation in 1862, although he did not publish anything until 1869 or 1870, or even later.

An extended study of the plastic surgery of the cervix, vagina, and perinæum, and the performance of very many operations for their restoration after injury from parturition, has given me an experience which warrants somewhat of positive statement. In the Clinic at the University, I have closed at least fifty lacerated cervixes during the past six years, and very many more in private practice, which, added to the total number performed since 1866, gives a very large field from which to draw deductions and rules for operating.

* Concluded from page 766 of last number.