FURTHER OBSERVATIONS
ON THE
DEVELOPMENT OF MAMMARY FUNCTIONS
BY THE
SKIN OF LYING-IN WOMEN.

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IN vol. lxi, p. 419, of the 'Medico-Chirurgical Transactions' will be found a paper "On the Development of Mammary Functions by the Skin of Lying-in Women," with a record of thirty cases (p. 438).

The description of the appearances was given as follows (p. 422) :

"1. They are situated in the skin of the axilla, which cannot be pinched up freely over them. On attempting to raise the skin it seems to be tied to the lumps by fibrous septa.

"2. They can be raised and isolated from the deeper

structures, and are not in the situation or of the shape and feeling of glands.

" 3. The skin over them is usually quite natural in appearance.

" 4. They are limited to the hair-covered surface.

" 5. They are usually soft and somewhat elastic, except when swollen.

" 6. They are usually somewhat flattened, their vertical diameter being the smallest.

" 7. They do not possess any nipple, pore, or duct.

" 8. Their size varies from the smallest perceptible to that of an egg, or perhaps larger."

As regards their course, no quotation need here be made.

As regards their secretion—

" 1. In the first eleven the mode of obtaining the secretion had not been discovered.

" 2. In the remaining nineteen (with one exception) secretion of some fluid was obtained.

" 5. The secretion was of three principal kinds:—(a) Granular débris, like the secretion of sebaceous follicles; (b) colostrum; (c) milk.

" 8. At the same time various follicles (in the skin over the lump) would produce various secretions. . . .

" 9. The secretion was expressed from the situation of the sebaceous follicles, as marked by the situation of the hairs."

These lumps were without nipples or pores.

Cases were quoted of other lumps in the axilla, by way of differential description, and to show that the author had not overlooked the following conditions:

A. Extension of mammæ into axillæ (p. 439).

B. Separate axillary mammæ with axillary nipples, pores, or ducts (p. 430).

C. Supernumerary nipples (without special gland-substance) (p. 432).

The following opinion was offered as to their nature (p. 435):

“ The cases which I have described, and which I believe have not been hitherto recognised, seem to prove that in lying-in women the sebaceous follicles of the skin are capable of producing true mammary secretions. The transition from granular material, through colostrum, to true milk, is distinct and unmistakable. They confirm the opinion that the breast is a highly specialised aggregation of highly specialised sebaceous follicles. . . .

“ I have not yet had an opportunity of making a microscopical examination, but these structures are so far from rare that, when attention is once directed to them, opportunities are sure to arise sooner or later. The secretions were too scanty for chemical analysis. It is far from improbable that they may share the pathological affections of the breast, and even be the seat of abscess.”

Since writing the above I have obtained the following material, which we have utilised for microscopical examination :

1. Skin from both axillæ (including subjacent tissue forming distinct lumps) obtained from a woman aged forty-two, who died in St. George's Hospital, having been delivered seven days previously of a six months fœtus.

2. Similar specimens from a woman under the care of Dr. Boxall, who died of uterine hæmorrhage. The autopsy was made twenty-eight hours after death ; old quiescent lung disease was found.

3. A similar case in all respects ; autopsy sixty-three hours after death.

All the specimens were hardened in spirit prior to examination. Sections were cut with a freezing microtome and stained in hæmatoxylin.

Microscopical examination of the “ lumps ” shows that the structure of each is the same. They consist of (a) a covering of normal skin, (b) loose subcutaneous tissue and fat, (c) aggregations of glands.

With regard to the latter, it must first be pointed out that they are placed at a considerable depth from the surface, in the situation of the sweat glands, and conse-

quently at a much lower level than that of the sebaceous glands.

The glandular tissue in all of the specimens is of the tubular type. It consists of a series of ducts opening through an interpapillary process, each duct passing in a straight or slightly wavy line through the epidermis and corium, and of convoluted tubes with which the ducts are continuous. The epithelium lining the duct is polyhedral, and consists of two or three layers of cells; that lining the deeper part of the tubes is not so well shown, as the specimens have not kept very well in the spirit, but the cells appear to be more columnar. It is, indeed, quite evident that the glands are sweat-glands, but on comparing them with sections of skin from the normal axilla some slight variations are seen.

In the first place, the amount of gland-tissue is greater than in natural skin, and the glands extend to a considerably greater depth from the surface, conditions which are well seen both in the sections and in the drawings from them (Plates IV and V).

In the second place, the arrangement of the glands is much more irregular than in normal skin: they do not seem laid down on so fixed a plan, and the coiled deeper parts are placed at very irregular intervals.

There is no alteration in the cells themselves, and no appearance of any secretion. The sebaceous glands are normal, and may be seen of perfectly natural size in the sections through the lumps. There is no appearance of any mammary tissue or of any other glandular structure beside those already mentioned. In all parts of the coiled tubes involuntary muscle-fibres are abundant, the layer of muscular tissue being more evident than in sections of normal skin.

It will be seen from the foregoing description that the microscopical examination of these lumps did not confirm the original opinion that the axillary lumps in question would prove to be of the nature of sebaceous glands. Indeed, they seem to agree with the description of the

skin-glands in the human axilla by Dr. Creighton in his paper entitled "Three Cases of Tumour arising from Skin-glands in the Dog," published in vol. lxxv of the 'Med.-Chir. Transactions,' from which we quote the following extract.

"It is well known that skin-glands, the same as those of the dog, are found not only in other mammalians and in some batrachians, but also in the human axilla, the areola of the breast, the groin, &c. The references made to the axillary skin-glands in recent histological works are apt to convey the impression that the glands are embedded in, or in close connection with, the corium like the ordinary glomerular sweat-glands. But their most characteristic and distinctive occurrence in the axilla is not in the substance of the skin, but as a separate and circumscribed layer, of brownish colour and lobulated surface, adhering to the under surface of the skin. This glandular layer will most probably be met with at the deepest part of the cutaneous recess, over the area where the skin adheres most closely to the axillary fascia. In a large number of observations made in the dissecting-room I have found the glandular structure sometimes as large as a florin and as thick, but more often reduced to a few scattered small lobules, apt to be mistaken for fat lobules, and not unfrequently wanting altogether. In a microscopic section, the tubular coils are found to be separated from one another and enclosed in a large quantity of connective tissue. Good specimens of plain muscular fibres may be obtained with great ease by teasing a minute portion of the glandular structure. These observations for the most part agree with the statement of Sappey,¹ who speaks of the skin-glands of the axilla as being collected into a circular layer under the skin, three to four centimètres in diameter and two millimètres in thickness. They are described also by Kölliker² as forming a continuous layer under the skin,

¹ Sappey, 'Traité d'Anatomie descriptive,' vol. iii, p. 505.

² Kölliker, 'Handbuch der Gewebelehre,' 1852, p. 147.

and by Frey¹ as being crowded together in a distinct stratum.

"The axillary glandular stratum in man is so variously developed, and so often wanting altogether, that it may be regarded as a rudimentary organ of cutaneous secretion.

"The axillary odour which characterises certain individuals of both sexes is probably associated with the presence of a well-developed stratum of the glandular substance.

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"According to an observation of Sappey's,² the large axillary skin-glands in man sometimes extend to the lateral and anterior regions of the thorax ; and I have in one instance found perfect examples of them in intimate association with the breast structure. The case was that of a woman aged thirty-eight, who had a large soft cancerous tumour removed from the outer part of the mammary region by Mr. Le Gros Clark, at St. Thomas's Hospital, in 1873. I made microscopic sections of the tumour as well as of the structure adjoining it ; and in the latter I found several minute cysts, about the size of a pin's head, which proved to be dilatations of the peculiar axillary skin-glands, and were so labelled by me at the time. The walls of each cyst showed, in the most exquisite form, a considerable expanse of plain muscular fibres in close parallel order ; a portion of that muscular-fibre membrane is drawn in fig. 2 (Pl. III), and the characteristic large-sized epithelium seated directly on the muscular coat is shown in fig. 3. These glands were in close proximity to ordinary lobules of the breast, but there was little difficulty in distinguishing the one kind of structure from the other."

It will be seen from the foregoing description that the lumps described by us are, in all probability, an enlargement of structures which are normally found in the human

¹ Frey, 'Handbuch der Histologie,' 1870, p. 596.

² Quoted by Henle, 'Handbuch der Anatomie des Menschen,' vol. ii, p. 35.

axilla, and that their origin is not to be traced to any aberrant mammary nodules.

The fact that various mammary secretions are produced by the lumps in question, having the characters of sweat-glands, as well as by mammary tissue, would seem to show either that mammary tissue is not necessarily a direct modification of sebaceous gland-tissue, or that similar secretions can be produced by more than one variety of skin-gland. In this connection it may be remembered that the ceruminous glands of the ear, which secrete "wax," are coiled-tubular, and not acinous in structure.

It may further be pointed out that, from the point of view of development, there is nothing incongruous in this assertion, seeing that the mammary structure originates by an ingrowth of the surface epithelium, as do both sudoriparous and sebaceous glands.

The very specialised form of sweat-glands described by Dr. Creighton as occurring in the human axilla, however, forbids the inference that sweat-glands of the ordinary kind are necessarily capable of producing mammary secretions in all parts of the body. Indeed, it is probable that the assumption of mammary functions by skin-glands is limited to these highly specialised sweat-glands.

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' Third Series, vol. vii, p. 175.)

DESCRIPTION OF PLATES IV AND V.

Further Observations on the Development of Mammary Functions
by the Skin of Lying-in Women (Dr. FRANCIS HENNEY
CHAMPNEYS, and Mr. ANTHONY A. BOWLBY).

PLATE IV.

FIG. 1.—Parts of a section through an “axillary lump” and superjacent skin, showing the large irregular masses of specialised sweat-glands extending to a much greater depth than in the normal axilla. Unaltered hair-follicles with their sebaceous glands are seen.

PLATE V.

FIG. 2.—A portion of “axillary lump” indicated by enclosure in Fig. 1, shown under a higher power.

FIG. 3.—Section through the skin and subcutaneous tissue of normal human axilla, showing the sweat-glands and their ducts.

Fig 1.