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On the anatomy of the breast - Of the nerves of the breast

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OF THE NERVES OF THE BREAST.

THE nerves which are destined to supply this organ are with the greatest difficulty traced to their minute branches, and ultimate distribution; nor can they be dissected with any certainty, unless the arteries are injected with coloured matter, to enable the anatomist to discriminate between the minute branches of arteries and nerves.

They are derived from the dorsal nerves; but still only from a part of that class of nerves: they are called dorsal, because they spring from the spinal cord within the vertebræ of the back.

The dorsal nerves, like the other spinal nerves, originate from three sources.

First, from an anterior root, which appears upon the anterior portion of the spinal cord.

Secondly, from the posterior root which is ganglionic; and the first after passing the ganglion unites with the second just beyond the ganglion.

Thirdly, of the grand sympathetic nerve, which unites with the dorsal nerves, near the place of junction of the two former nerves.

Thus they are constituted to give motion from the first

origin; sensation from the second or ganglionic, and to support general connection; secretion and involition by the grand sympathetic.

It is not my intention to describe all the branches of the dorsal nerves, but only those immediately connected with the breast.

The dorsal nerves, when they reach near the middle of the sides of the chest, by passing in the groove at the inferior edge of the ribs, divide into two portions, into a direct and a reflected branch.

The *direct* penetrate the intercostal muscles at the lower edge of the ribs, and pass directly forwards to the parts upon the surface of the chest.

The *reflected* are continued forwards at the lower edge of the ribs, in the groove which contains them, the artery and vein, until they reach the cartilages at their junction with the sternum: here they penetrate the intercostal spaces, and pass to the parts of the fore-part of the chest, being reflected backwards towards the sternal part of the breast.

The direct nerves are placed posteriorly to the breast; the reflected are anterior or sternal.

First, of the direct, or posterior.

The first dorsal nerve principally forms a part of the axillary plexus of nerves; but it sends off a posterior branch

to the axilla, and back of the arm; it also forms a small reflected nerve which penetrates the fore-part of the chest, and is distributed to the pectoralis major muscle and skin below the clavicle.

The second posterior dorsal nerve passes out of the chest below the second rib, and sends down branches upon the external mammary artery towards the breast; in my plate a nerve from the second dorsal descends to the posterior surface of the breast, and also gives branches to the pectoralis major.

The third direct or posterior dorsal nerve divides into two principal branches; one passes to the part of the chest just above the breast, and the other branch is distributed upon the external mammary artery.

The fourth dorsal nerve appears just below the fourth rib, emerging through the intercostal space from the inner part of the chest. It almost immediately divides into two nerves; the upper branch passes to the external mammary artery, and descends with it to the upper part of the mamma. The second branch passes upon the surface of the breast and advances to the basis of the nipple, where it divides into branches which supply its papillæ.

The fifth direct dorsal nerve appears emerging under the lower edge of the fifth rib, and it is continued below the

edge of that rib to the gland of the breast, upon the surface of which it passes and divides into numerous branches which supply the lower part of the nipple, and there joins with the fourth nerve.

The sixth direct or posterior nerve is divided into two. It passes below the breast, but sends some filaments to the vessels below the nipple on which it is distributed, some of its filaments ascending upon the arteries towards the breast.

The seventh dorsal has no communication with the mammary gland, or the mamilla. From my dissections, then, it appears that the fourth and fifth posterior nerves are most directly distributed to the breast, but that the third descends upon the vessels which are afterwards distributed to the nipple and gland, and that the sixth sends some filaments upon the extremities of those arteries which have passed the nipple, but which send branches into the gland.

The fourth and fifth posterior or direct nerves form a plexus at the basis of the nipple and areola, and with the branches of arteries are distributed to the papillæ. The nerves which pass to the sternal side of the nipple join with the anterior on that side of the nipple and areola.

The third, fourth, and fifth nerves have lateral communications with each other by distinct branches of nerves.

The Anterior or Reflected Nerves.

In the subject from which my figure was delineated there was a reflected nerve (which, however, does not always exist,) between the first and second ribs. This accompanied the first branch of the internal mammary artery, and was distributed to the skin of the fore-part of the chest and to the pectoralis major.

The second anterior nerve passed out of the chest between the second and third ribs, and sent branches to the skin of the anterior and upper part of the chest above the breast, below the clavicles, and anastomosed with the second posterior or direct nerve.

The third anterior or reflected nerve divided into two branches; the first passed across the chest above the breast, the second descended for some way upon the anterior branch of the internal mammary artery which supplies the breast and nipple at its upper part.

The fourth anterior nerve was divided into two branches which passed through separate holes; the first proceeded upon the surface of the breast to the basis of the nipple, the second to the upper and inner part of the gland of the breast.

The fifth joined the lower part of the fourth, and distributed a few filaments to the skin at the lower part of the breast.

The sixth anterior passed below the breast.

It therefore appears that the third anterior or reflected nerve passes upon the vessels which descend to the breast, and that the fourth goes to the base of the nipple anteriorly. The fifth, which passes below the breast, is but a small nerve.

As a strong connection or sympathy exists between the uterus and the breasts, it has been supposed that the epigastric artery might be the cause of such sympathy, and that more blood might be sent by it to the internal mammary artery and to the breast itself after delivery than before, by means of the anastomoses between the epigastric and internal mammary. This is very probable, but it is not the cause of the sympathy, but the effect of it, more blood being determined to the breast than before in consequence of that sympathy, by means of the free anastomoses existing between the blood-vessels,—a mechanical effect of that connection. For myself I see no other cause but through the grand sympathetic nerve, the branches of which are incorporated with the dorsal nerves of the breast, and are largely distributed to the uterus to connect the two parts in function.

It may be objected to this opinion that the grand sym-

pathetic nerve is connected with the other spinal nerves, and that, consequently, other parts should similarly sympathize. They certainly do strongly sympathize, but the effects are as dissimilar as the functions of the organs; and it is owing to the breasts sympathizing strongly only under certain states of the uterus, as, for instance, in lactation, that it is more the subject of observation.

There is a drawing, from a dissection made by Mr. Pears and myself, given in the *Philosophical Transactions* of 1805, of a woman of twenty-nine years, who might be said to have had no ovaria, in whom the menstrual secretion never occurred, and the usual appearances of puberty on the surface of the body were absent, whose breasts were not more evolved than those of the male, and in whom the uterus was infantile.

Mr. Pott also mentions a case of ovarian hernia in which he removed both ovaria, and the woman grew fat and never afterwards menstruated.

From this it appears that imperfection in the ovaria has at least as much effect upon the evolution of the breast, and other sexual organs, as a defective state of the uterus; and the removal of the testes produces similar effects upon the evolution of certain organs in the male.