D II Hons/Zoology Paper IV - Gr - A
Lecture No - 26

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MAMMARY GLAND

Mammary gland is characteristic of all female mammals. The mammary gland is located in the breasts of females that is responsible for lactation or production of milk. There are paired structure that Contain glandular tissues and variable amount of fat. Both males and females have glandular tissues within the breasts but in females the glandular tissues begin to develop after puberty in response to estrogen release.

Structure :- The mamary glands are paired structures that contain glandular tissue and variable amount of fat. The glandular tissue of each breast is devided into 15-20 mammary lobes containing clusters of cells called alveolie. The cells of alveoli secreti milk, which is stored in the cavities (lumens) of alveoli. The alveoli open into mammary tubules. The tubules of each lobe join to form mammary duct. Several mammary ducts join to form a wider mammary ampulla which is connected to lactiferous duct through which milk is sucked out.

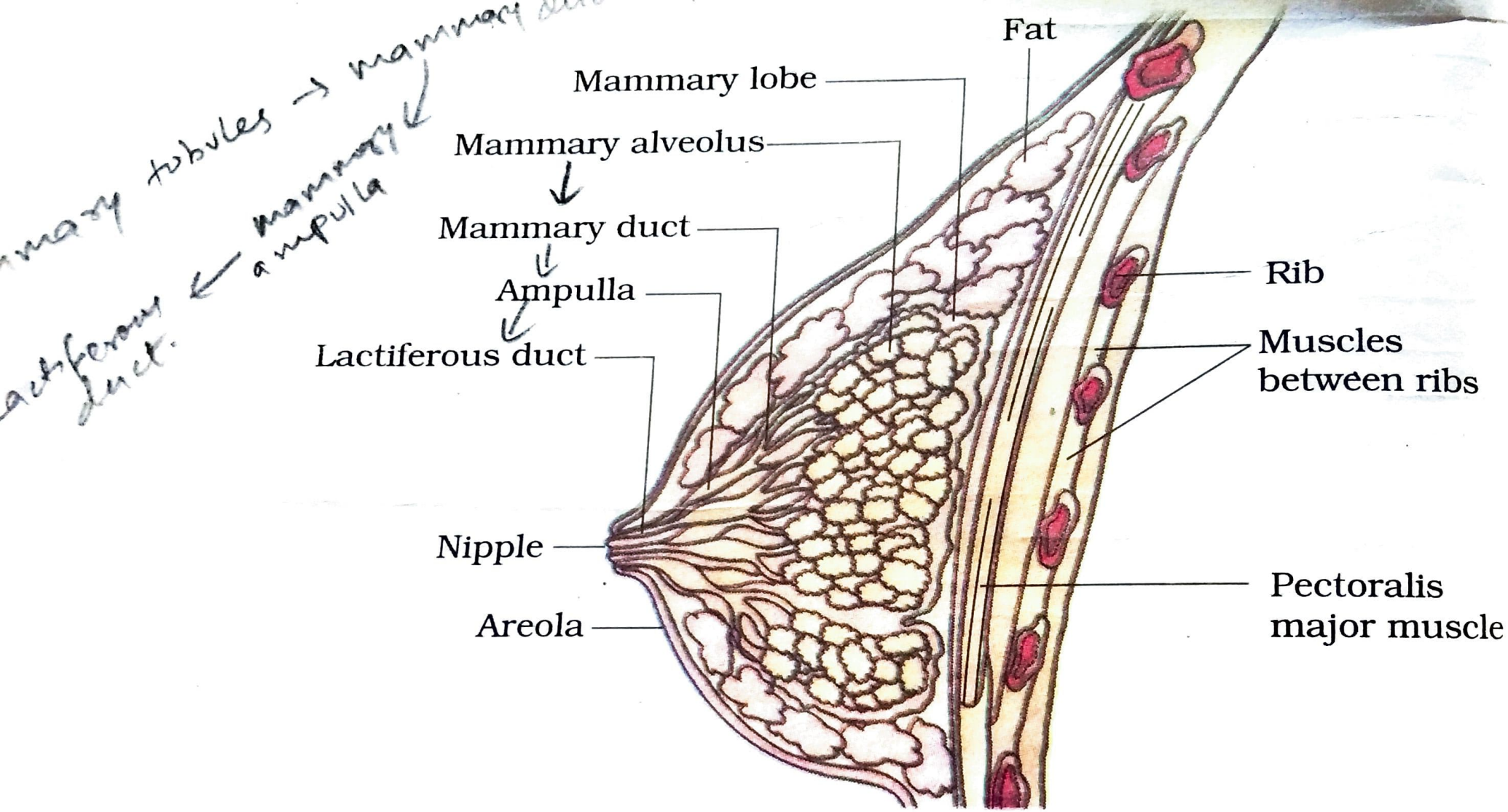

Figure 3.4 A diagrammatic sectional view of Mammary gland

The structure of mammary gland is devided into three parts which include the skin, the parenchyma and the stroma.

(1) Skin – It consists of a nipple and areola.

(a) Nipple :- It is conical eminence, present in the fourth intercostal space. 15-20 lactiferous ducts pierce the nipple. Nipple contains circular and longitudinal smooth muscles fibres and is rich in the nerve supply. These smooth muscles help in erecting the nipple upon stimulation. It does not contain any sweat gland, fat & hairs.

(b) Areola :- The dark pinkish brown pigmented area around nipple is called areola. It is rich in modified sebaceous glands called tubercles of Montgomery in pregnancy and lactation. These gland secretion by secretion that prevents cracking of nipple & the areola. Areola is also devoid of hair and fat.

(2) Parenchyma :- The glandular tissue of the mammary gland is made up of branching ducts & terminal secretory lobules. There are 15-20 lobes & a lactiferous duct drains each of them. These ducts enlarge to form lactiferous sinus before they open separately in the nipple. The milk is collected in the lactiferous sinus & let out on the suckling of the baby. The lactiferous ducts are arrayed radially in the nipple.

(3) Stroma :- This is the supporting framework of the breast around the parenchyma.

(a) Fibrous stroma :- This gives rise to septa called suspensory ligament of Cooper which separates lobes and suspends the mammary gland from the pectoral

(b) Fatty stroma :- Even though the nipple and the areola are devoid of fat, the main bulk of the mammary gland is filled with variable amounts of fat.
Till puberty the development of breast is minimal and comparable in both the sexes. At puberty under the influence of oestrogen and growth hormones, the breasts develop faster in females with a massive development of adipose tissues. Similarly, in early pregnancy, the breast size increases rapidly due to increase in size due to increase in Parenchymal growth & branching in the ductal system. These changes are due to secretion of estrogen and progesterone hormones.

In later stage of life especially after menopause the breasts show severe regression in size and almost atrophies with a drop in level of estrogen.

Functions :- The primary purpose is to secrete milk which helps in the breastfeeding of the infants.

Hormonal Control on lactation :- The levels of the repro hormones oestrogen, Progesterone, placental lactogen, Prolactin and oxytocin change during reproductive development or function & act directly on mammary gland, to bring about developmental changes or co-ordinate milk delivery to the offspring.

Metabolic hormones play also to regulate metabolic processes to nutrient intake or stress on mammary glands. The important hormones in this regard are growth hormone, Corticosteroids, Thyroid hormone and Insulin.
A Third category of hormone has recently been recognized the mammary hormone. It includes GH, Prolactin, PTHrP & leptin.

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