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A REVIEW ON ANATOMICAL AND SURGICAL IMPORTANCE OF MAMMARY GLAND

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Abstract

ABSTRACT

The mammary gland is an exocrine gland present in female mammals responsible for the production and secretion of milk during the process of lactation. It is mainly composed by epithelial cells and adipocytes. The features that make mammary gland unique are 1) its highly plastic properties displayed during pregnancy, lactation and involution (all steps belonging to the lactation cycle) and 2) its requirement to grow in close association with adipocytes which are absolutely necessary to ensure mammary gland development at puberty and remodelling during the lactation cycle. (Georgia colleluori, Jessica perugini, Giorgio barbatelli, and saverio cintr (2021).

Conclusion

The knowledge about anatomical concepts helps for surgical treatment

Keywords

lymphatic drainage surgical importance

Cover Page Footnote

anatomical and surgical importance of mammarygland

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INTRODUCTION

The mammary gland is a modified sweat gland present in the superficial fascia of pectoral region. The mammary gland is found in both sexes. It is rudimentary in male but becomes well developed in female at puberty. The breast is made up of mammary gland, the fatty superficial fascia in which it is embedded and the overlying skin with the nipple and the surrounding pigmented skin the areola. A highly developed and specialised organ, the mammary glands are found in pairs, one on each side of the anterior chest wall. Milk production is the organ's main role.

An exocrine gland called the mammary gland is found in female mammals and is in charge of producing and secreting milk during lactation. Adipocytes and epithelial cells make up the majority of its cells. Mammary glands differ from other glands in two ways: 1) they exhibit highly plastic properties during pregnancy, lactation, and involution (all phases of the lactation cycle); and 2) they must grow closely in association with adipocytes in order to ensure mammary gland development at puberty and remodelling during the lactation cycle**.** (Georgia colleluori, Jessica perugini, Giorgio barbatelli, and saverio cintr (2021).

The mammary gland serves a number of immunological purposes, such as defending against mastitis and defending newborns from pathogenic organisms. In particular, the mucosal address in cell adhesion molecule-1 (MAdCAM-1) and glycosylation-dependent cell adhesion molecule-1 (GlyCAM-1) in the mammary gland are the focus of this review's discussion of these molecules' functions in the immune system. The mouse mammary gland expresses lactation GlyCAM-1. This protein is made by endothelial cells and is secreted into milk. GlyCAM-1 in the mammary gland has a different glycosylated modification than in lymph nodes, and it does not have the ability to bind to L-selectin on lymphocytes. GlyCAM-1 in the mammary gland serves a purpose that is likely unrelated to lymphocyte migration. (Toshhide Nishimura 2003).

The most prevalent cancer in women globally is carcinoma of breast, which is major negative influence on patients' both physical and emotional health. Its prevalence is expected to increase further. MicroRNAs (miRNAs) appear to be important regulators of carcinogenesis

and development, according to growing research.. Since miR-9 has competing roles in both the formation and spread of breast cancer, it is vital to recognise that miR-9 plays a significant role in both of these processes. (Li, X., Zeng, Z., Wang, J., Chen, 2020)

The second most common cause of cancer-related fatalities in the US is breast cancer, which affects women more frequently than any other type of cancer. Patients who have been diagnosed with distant metastases still have a very bad prognosis, despite the fact that early identification has considerably reduced breast cancer mortality. Local lymph nodes are where breast cancer spreads most frequently. Therefore, one of the most crucial prognostic variables for breast cancer patients is the existence of lymph node metastases. Greater attempts have been made to comprehend the molecular mechanism driving lymph node metastasis in breast cancer because of its major therapeutic significance. (Braino To, Daniel Issac, eran R Andrecheck 2020).

PATTERN OF LYMPAHTIC DRAINAGE

Although the histology characteristic of (MASC) Mammary analogue secretory carcinoma has been characterised in earlier investigations, its clinical manifestation is infrequently described. The goal of this study is to highlight the clinical features of this underdiagnosed entity as well as the aggressive therapeutic strategy needed for preoperative assessment, intraoperative illness clearance, and postoperative patient monitoring. Due to its potentially aggressive nature, MASC of the submandibular salivary gland should be kept in mind as a potential differential diagnosis of salivary gland tumors even though it is a rare cause of neck swelling in teenagers. (Mehta, R., Chakravarty, S., Nagarkar, 2022)

The therapeutic course of secretory carcinoma is often apathetic and has a low probability of relapsing, making them similar to other low-grade All malignant salivary gland tumors (MSGT). (Ayre, G., Hyrcza, M.,2019).

The differential diagnostic list for metastatic carcinomas to cervical lymph nodes should include mammary analogue secretory carcinoma because it is difficult to diagnose. (Omar, S. S., Daugherty, 2022)

Due to their similar histological characteristics, it is very possible that many instances of SC will initially be classified as acinic cell carcinoma (AciCC). Minor salivary gland-originating SC is treated similarly to aciCC, although SC is frequently extremely malignant and has a significant chance of cervical lymph node metastases. Therefore, it is crucial to make a precise diagnosis in collaboration with pathologists and to use genetic analysis to validate the presence of the ETS variant 6-neurotrophic receptor tyrosine kinase 3 fusion gene. (Ogawa, M., Yokoo, 2021)

The investigation's findings showed that both Zerumbone-loaded Nanostructured Lipid Carrier Induces (ZER-NLC) and zerumbone (ZER) are effective at slowing the growth of and causing cell death in CMT cells. ZER-NLC induces apoptosis by suppressing the antiapoptotic Bcl-2 protein, promoting the expression of the proapoptotic Bax gene, and activating the caspases of the intrinsic and extrinsic apoptosis pathways. and ZER had lethal effects on CMT cells. Compared to ZER, ZER-NLC demonstrated a more potent and persistent anti-CMT action. Due to its unchanged structure, the ZER-NLC has the potential to be evolved into a cutting-edge and safe delivery strategy for the treatment of CMT. ZER has a continuous drug release property in addition to having a cytotoxic impact. (Foong, J. N., Selvarajah, G. T., Rasedee, A., 2018).

SURGICAL IMPORTANCE

Maintaining the breast's ideal shape requires only the minimal amount of tissue to be removed. On the other hand, obtaining negative tissue margins is crucial. Before the surgery, the site of the lesion was tagged with a skin marker to designate it as the operating site. Magtrace magnetic markers were used to identify the lymph nodes, and under ultrasound control, Magseed magnetic markers were applied to the tumour. The Magseed marker is a straightforward approach for localising non-palliative lesions in the mammary gland, and the high detection rate immediately correlates to a decrease in the proportion of non-radical therapies in the case of sparing treatment.(Cieciorowski, M., Wow, 2022).

The breast ductal system can now be seen clearly due to a novel technology called mammary ductoscopy, sometimes known as the intraductal approach. It makes it possible to take a sample of the ductal epithelium, which may make it possible to detect early cytological changes as well as potentially aid in surgical excision. This might make breast lumps easier to

find before they can be felt or seen on a mammogram. Mammary ductoscopy may be used to evaluate high-risk women, those who experience nipple discharge, or those who want to have less tissue removed during cancer breast conservation surgery. (Kapenhas-Valdes, 2008)

After a lumpectomy for DCIS, by using clinical and pathologic characteristics as well as, more recently, molecular profiling, risk stratification can assist in clinical decision-making for the use of hormone therapy and radiation therapy. De-escalating therapy may be possible, and in certain trials, it may even be done without surgical excision by employing core biopsy alone. (Solin L. J. 2019).

On examination of patients with sudden discharge of nipple, mammary ductoscopy may be helpful. This office technique has few risks and consequences and is generally well tolerated. Mammary ductoscopy may be used to evaluate high-risk female patients. For these prospective uses to be verified, more investigation is required. (Valdes, E. K., Boolbol, S. K.,2016).

After a mastectomy, placing prepectoral implants has become a reliable surgical option for breast reconstruction. Even in individuals who have received radiation therapy, problems such as implant extrusion and capsular contracture can be substantially reduced by maintaining the breast envelope and expanding soft tissue covering. Psychosocial health of the patient and high level of reconstructive care satisfaction outcome are influenced by short-term benefits like a quick recovery and preserved pectoralis muscle function. Prepectoral implant- based breast reconstruction (IBBR) still raises concerns about general implant-related issues such as breast asymmetry despite the fact that many long-term disorders associated with subpectoral implant placement, such as breast animation and reduced muscle function, are successfully avoided. Nonetheless, it does offer patients who cannot or do not want to undergo autologous breast reconstruction good to great aesthetic and functional benefits. Despite significant advancements in recent years, the prepectoral IBBR's collective learning curve has not yet reached a plateau. In addition to the collective experiences of breast surgeons around the world, extensive clinical trials will continue to offer essential data and chances to develop the procedure. So, in order to give patients the best treatment possible, surgeons should work to incorporate new finding into their professional practices. (Weinzierl, A., Schmauss, D.,2022).

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