A Review on Breast Fibroadenoma

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Abstract- *Nowadays breast lumps are an common issue among women as they play a major part of female breast diseases in that way Fibroadenoma is one frequent non cancerous breast masses that occurs mostly in a young girls and women. Because this fibroadenomas are associated with the female reproductive hormone levels such as estrogen. But there is possibility to change fibroadenoma into breast cancer if left untreated. So it is necessary to all the women have a knowledge about the disease and to manage it. Hence this article aims to explain the fibroadenomas (a benign breast tumor) its classification, an anatomy of the female breast, etiology, histopathology, diagnostic techniques, various methods of treatment involved in fibroadenoma and their complications.*

Keywords- Fibroadenoma, non cancerous, young girls, women, female reproductive hormones.

I. INTRODUCTION

Fibroadenoma is one of the frequent breast diseases that commonly affect girls and women. Nowadays it was much more common in adolescent females [1][2].Fibroadenoma are non-cancerous ,painless ,benign breast tumors which is formed by the glandular tissue and connective (stromal) tissue which is found under the breast skin These fibroadenomas are also referred as breast mouse due to their high mobile nature[3][4]. These breast lumps typically range from 2to 3cm [5].Generally they remain stable in their size .However very few may reduce over time. These masses are found to be single as well as multiple. They accounts for 68% of all the breast masses and 44% to 94% of the biopsied lumps [6]. Sometimes they are uncommonly undergoes malignant transformation.

CLASSIFICATION

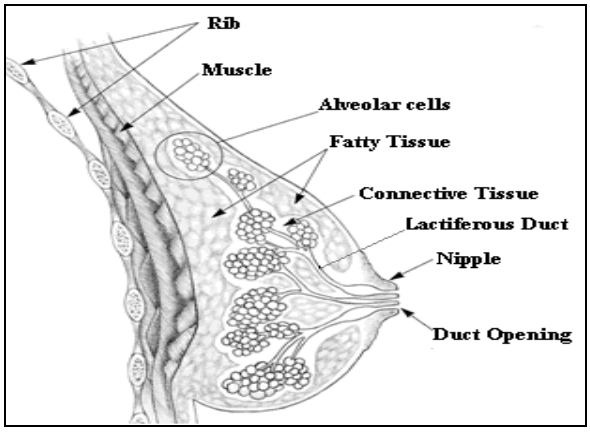
According to microscopic and histopathological analysis fibroadenomas are classified into five types which includes:[2].

TABLE: This table shows difference between types of fibroadenoma. [7][8]

FIBROADENOMA SUBTYPE	DESCRIPTION
Juvenile fibroadenoma	Mass >5cm or >500mg Stromal and epithelial hyperplasia
Complex fibroadenoma	Mass >3cm Apocrine hyperplasia
Giant fibroadenoma	Mass >5cm in diameter High stromal cellularity.
Myxoid fibroadenoma	Myxoid stroma
Cellular fibroadenoma	Relatively high cellular component Also referred as juvenile type.

ANATOMY OF THE BREAST

The anatomy of the female breast has the complex organizational structure. Breasts are made up of fat and connective tissue along with lobes, lobules, lymph nodes, nerves, veins, arteries.



The breasts of adult woman are milk producing, tear-shaped glands. They are supported by and attached to the front of chest wall one either side of the breast bone or sternum by ligaments. They rest on the major chest muscle, the pectoralis. A layer of fat surrounds the glands and extends throughout breast.

Each breast contains 15 to20 lobes in each breast .Each lobule has 20-40 lobules.[9]The fat (subcutaneous adipose tissue) that covers the lobes gives the breast its size and shape. Each lobe is comprised of many lobules, at the end of which

are tiny bulb like glands, or sacs, where milk is produced in response to hormonal signals.

The breast is responsive to complex interplay of hormones that cause the tissue to develop, enlarge and produce milk. The three major hormones affecting the breast are estrogen, progesterone and prolactin which cause glandular tissue in the breast and the uterus to change during the menstrual cycle.

ETIOLOGY

Fibroadenoma is the proliferation of the stromal and epithelial tissues arising from terminal duct-lobular unit and their exact etiology is unknown up to date. Fibroadenomas are associated with levels of the female reproductive hormones[10][11].Estrogen plays major role in the development of lumps [4] .High level of estrogen due to pregnancy or hormone therapy increases the lumps size however after menopause most of them tend to shrink on its own. Its development and continuation depend on the presence of ovarian hormones, full term pregnancies contraceptives before the age of 20 are at higher risk of development of fibroadenoma. [12]

EPIDEMIOLOGY

Fibroadenoma tends to occur at an early stage. These lumps are commonly found in teenage girls and uncommon in postmenopausal women.[10]The incidence of fibroadenoma decreases with increasing age and usually occurs before age 30 in women in the general population. [13]It is found to be that 10% of the worlds females suffers by fibroadenoma once in their life period. Nearly 90% of people attending breast clinic will have benign breast disease.

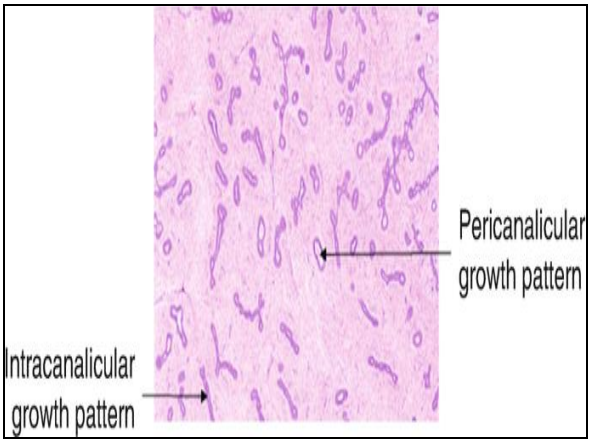
HISTOPATHOLOGY

These fibroadenoma well confine, non encapsulated lesion with depressed margin that does not infiltrate the surrounding parenchyma. They are characterized by the cellular promoters of stroma and glands (benign breast ducts). [14][15] The ratio of glands and stroma is relatively instantaneous throughout the lesion. This Stroma are uniform, vascular, and consist of spindle- shaped cells with inconspicuous oval to elongated nuclei. Stromal cell pleomorphism is absent. It is also found to be smooth muscle ,cartilage bone may also be identified inside the stroma. Stromal mitosis is rare that are seen common in young women with fibroadenoma. In the case of fibroadenoma the glands contain normal bi- cell layer in the breast ducts. The inner layer of gland consists of cuboidal to columnar- shape cell with define shaped nuclei. Myoepithelial cells support the inner cell layer. The intact layers of myoepithelial cells forms throughout the lesion, suggesting the benign nature of the breast mass.

Glands are often associated with usual type hyperplasia, apocrine metaplasia , cyst formation or squamous metaplasia. The glandular component recognized in 2 patterns.

Intracanalicular- glands are compressed into linear branching sructures by proliferating stroma.[16]

Pericanalicular-glands retain open lumens but are seperated by expanded stroma.[16]



In fibroadenoma many histological variants are seen. Despite of patterns and histological variants are found in fibroadenoma benign nature of the lesion does not change. But uncommonly atypical ductal hyperplasia, atypical lobular hyperplasia ductal carcinoma, lobular carcinoma, invasive carcinoma can involve in a fibroadenoma. [17-19]

II. DIAGNOSTIC METHODS

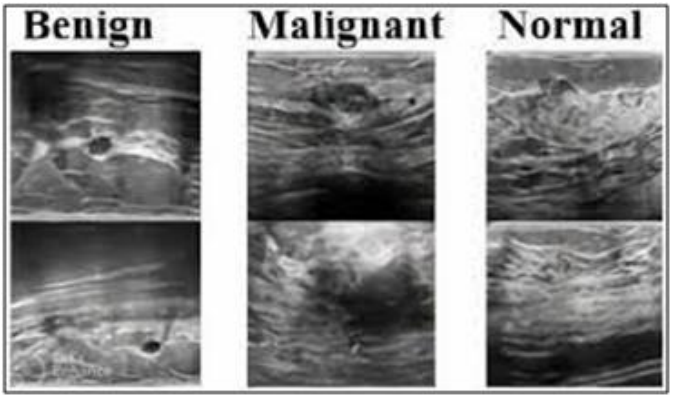
In most of the case the fibroadenoma are diagnosed based on their symptoms such a breast lumps, swelling or pain. These symptoms may increase before the menstrual begins and differs according to the stages of the menstrual cycle. Breast feels lumpy and rarely nipple discharge may occur. Physical examination of the lumps shows the following features,

- Non tender or painless
- Mobile
- Solitary
- Rapidly growing solid lump with rubbery consistency and regular borders.

After physical examination imaging techniques are performed.

Breast ultrasound

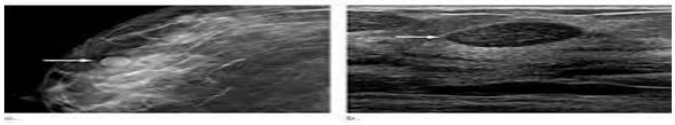
Ultrasound is a non- invasive imaging technique. Breast ultrasound includes sound waves to show a picture of the breast by performing ultrasound appropriate size and shape of the lumps could be found. It is also useful in determining the number of masses and information on their growth. This test also shows the variations between the solid breast mass and fluid filled cyst.



Generally these lumps are appears as, well confined, round or oval shaped with uniform hypoechogenicity. Intralesional sonographically detectable calcification may observe in rare case. [20]Breast ultrasound can avoid the unwanted biopsies .In this technique, a transducer is gently pressed the skin that emits sound waves which penetrate into the breast tissue then reflect back to develop the image on the screen .Technique is safe, non- painful, and free from radiation hence it remains better choice for examining breast mass and much more useful in pregnant women with dense breast tissue.[21]

Mammograph

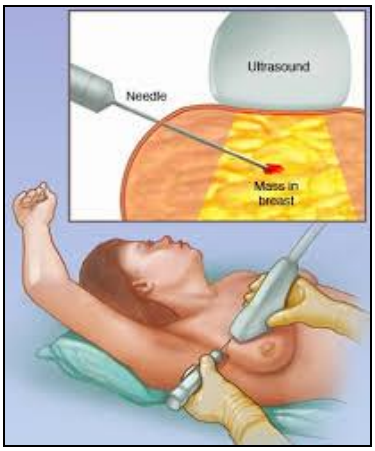
Mammogram utilizes the x-rays to make an image of breast tissue. This helps to detect the borders of fibroadenoma and sets in away from other normal tissue [10]. But mammography is not a best method for imaging fibroadenomas in young females with dense breast tissue. [21] Because of dense tissue make it difficult to differentiate between the normal breast tissue and fibroadenoma .This technique is also found to be risk due radiations so they are not preferred for young peoples .They are preferred for women above 35 years for imaging breast lumps.



BREAST ULTRASOUND BREAST MAMMOGRAM

Fine needle aspiration

Fine needle aspiration is shortly known as FNA. It helps to determine whether the lump is cancerous or not. FNA is the procedure used to obtain the sample of cells by aspirating through the syringe from the breast tissue. This test is used to determine the condition of the breast lump. If breast lump is confirmed this test the breast lumps this helps to determine whether it is a cyst, or infection, a benign tumor or cancer [22]. FNA avoids unwanted surgery and they are cost effective method.



FNA-fibroadenoma

Core needle biopsy

A common biopsy method in fibroadenoma is a core needle biopsy [23][24]. In which ultrasound device helps to spot the point where the needle to be insert. An exceptional hollow needle collects the small sample of tissue from the breast sent for examination for confirming the type of breast lump.

Fine needle aspiration	**Core needle biopsy**
In FNA very thin, hollow needle attached to syringe is used to collect small quantity of fluid or small pieces of tissue.	In CNB little big size needle is used than the FNA in which small cylinder-shaped tissue are collected and examined.
It does not require anesthesia.	This is done under local anesthesia

Physician may choose one of these two methods depends upon size, shape, location and number of breast lumps. Sometimes biopsies remain uncertain because only one side of lesions sample were taken for biopsies. It may give false positive reports so that cancer remains unidentified.

TREATMENT

For fibroadenoma there is no medical treatment. There are no drugs to reduce the size of the lumps. They are responsive to female hormones some will enlarge during pregnancy or with estrogen therapy and shrink or disappear after menopause. If the lumps are painful, large, fast growing further treatment should be started under the advice of the doctor. Various methods of treatment involved, they are as follows,

Stand by for

Not all the fibroadenoma lumps cause problem. Some lumps are small such lumps tends to resolve itself after sometimes hence no need to treat them. But they are need to be continuously monitored if they continue to grow bigger in size or showing a discomfort they need to treat carefully.

Laser ablation technique [25][26]

It is the fast, painless, technique which leaves small scar on the breast with no change in the breast shape. This procedure is done under the local anesthesia. The patient will also recover within few hours. The procedure includes finding the target with ultrasound then positioning the laser and temperature probes it heats the fibroadenoma to 60^{o}C heat radiates to the outer boundary of the ablates the tumors.

Cryoablation [27]

Cryoablation is one of the latest techniques employed in the breast lumps. This technique destroys the non cancerous breast lesions by freezing them below -170 at this temperature the tumor cells will die. A needle less than 3mm diameter injects the liquid nitrogen through the tip of the needle inserted into the skin and into the tissue to be removed. This results in freezing and destruction of the lumps.

Vacuum Assisted Excision

Conventional treatment method in fibroadenoma is removing the lumps by surgery .This method is usually simple and generally followed under local anesthesia. If the tumors are big general anesthesia will be used .Since from1990 Vacuum assisted breast biopsy (VABB) technique has been used. This involves a minor cut being made in the breast and the tumor then tumor is removed by using a needle which is attached to the suction device. It was an minimally invasive technique but leaves scar on the skin.[28][29]

Lumpectomy or Excision biopsy

Lumpectomy is the surgical procedure to remove the large lumps. Lumpectomy is considered as the major surgery which is removed under the general anesthesia. Local anesthesia is also used in the case of small lumps .the procedure includes making cut on the breast near the tumor then removing it completely including small amount normal cells that surrounds the tumor. After removal of lumps the cut closed by making the stritches on it using sutures. Usually patients recover on the same day. It can preserve the actual shape and structure of the breast. One of the disadvantage of this lumpectomy is reoccurance may after removal.

COMPLICATIONS

Usually fibrinoadenonmas does not cause cause any complications. But it is possible that fibroadenoma may change into breast cancer rearely [30]. The risk of breast cancer in high in complex fibroadenoma however less risk in simple fibroadenoma .Some fibroadenoma will shrink and disappear over time . If their size is large that may compress other normal breast tissue.

CHEMOTHERAPY IN FIBROADENOMA

Presence of estrogen receptors on tissue obtained from fibroadenoma has described, hence **Centchroman** an antiestrogen is used in the proliferation of doctolobular tissue of fibroadenoma. A pilot study revealed the efficacy of centchroman in regression of fibroadenoma.[31]

III. CONCLUSION

Fibroadenomas are most common non cancerous breast masses encountered in the adolescent populatoin.The discovery of a breast lump will cause anxiety hence it is necessary to clearly communicate and reassure the patient throughout the treatment.Timely identification and effective treatment can reduce the unwanted risk of fibroadenomas.

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