# Ultrasound guided therapeutic excisional vacuum assisted Biopsy in Fibroadenoma (BIRAD3 lesions)

*Thesis*

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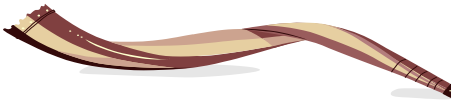

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# Abstract

**Background:** Our study showed that ultrasound-guided, vacuum-assisted excision can play an efficient role in the diagnosis of benign breast lesions and is a safe and successful alternative treatment of fibroadenomas. Although the breast fibroadenoma is a common benign breast tumor, the treatment and follow-up of these lesions is still debatable. We suggest that UGVAB, which has a well-documented role in the diagnosis of breast lesions, may provide an option for the definitive treatment of breast fibroadenomas.

**Objective:** The objective of our work was to evaluate ultrasound-guided, vacuum-assisted excision (UGVAE) as an alternative approach in the diagnosis of radiologically benign breast lesions.

**Patients and Methods:** We prospectively evaluated breast lesions excised using VAB between April -October 2017 at Ain-Shams University /interventionl radiology unit at radiology department, which had a proven diagnosis of fibroadenoma. An informed consent form was obtained from each patient of a total of 25 cases ultrasound-guided VABB using biopsy system. All patients have been subjected to breast ultrasound examination .

**Results:** Thirteen patients developed hematomas during UGVAE but none needed surgical intervention, while twelve patients pass with no significant hematomas, with 100% cure rate. None of the patients experienced significant enough pain to require the cessation of the procedure, although 22 (88%) patients reported mild pain and moderate pain (12%) during procedure. At the two week control, 3(12%) patients reported taking paracetamol for mild pain. In ten of them (40%) the pain was strong enough to interfere with sleep.

**Conclusion:** Vacuum assisted Ultrasound-guided biopsy allows real-time imaging, could be performed without breast compression, and is the preferred method if the lesion is detectable with ultrasound.

**Keywords:** Breast fibroadenomas - Vacuum assisted excisional biopsy - ultrasound-guided, vacuum-assisted excision

# INTRODUCTION

Breast fibroadenomas (FA) are a common cause of a benign discrete palpable lump in females **[Carty, N.J., Carter,2005].**

They are relatively more common in patients aged between 15 and 35 years. They often present as a painless mobile breast lump which are discovered incidentally in the majority of cases by the patients themselves. They can also be discovered during investigations for other breast conditions or during routine screening imaging or examination. They may either remain static, continue to grow or decrease in size. **[Smallwood, J.A., Roberts,2007].**

Sixty nine percent of breast lesions undergoing open surgical biopsy are found to be benign **(Clin Radiol,2009)** and fibroadenomas (FA) constitute about 50% of those lesions **(Greenberg R, Skornick Y,2010).**

Vacuum assisted excisional biopsy (VAB) utilizes large bore needles and can extract larger tissue samples compared to fine needle biopsy and core biopsy this leads to a decrease in the rate of negative biopsies as well as a decrease in discordance between the biopsy material and surgical specimen.VAB is also recommended for lesions located close to the thoracic wall or nipple, since it does not employ a forward moving needle **(Park HL, Kim LS,2012)**.Benign lesions may need to be removed if

they grow, or symptomatic or produce anxiety in the patient. However, surgical excision is costly, since it requires an operating room and sometimes hospitalization. Because it can extract large volumes of tissue, VAB can also be used for the excision of benign breast lesions **( O'Flynn EA, Wilson AR,2010).**

Cost-effectiveness has been proved, and this procedure is currently approved for the resection of breast fibroadenomas and other types of benign breast lesions which usually are removed in the operating room. With US-VAB, these patients may avoid going into surgery if the lesion is confirmed to be benign.

As it is a procedure performed under image guiding, the radiologist is the best qualified professional to apply it. **(Alonso-Bartolomé P. et al, 2004).**

# Aim of the work

The aim objective of our work is to evaluate ultrasound-guided, vacuum-assisted excision (UGVAE) as an alternative approach in the diagnosis of radiologically benign breast lesions.

# Gross anatomy of the breast

The breasts or Mammary Glands are a pair of symmetrical hemispheric tissue mounds on the anterior wall of the chest. The breasts extend from the $2^{nd}$ rib to the $6^{th}$ rib vertically and from the edge of the sternum to the midaxillary line (latissimus dorsi muscle) horizontally. and breast tissue can reach as far superior as the clavicle. ***(Wentz and Hill., 1997).***

The breasts are enclosed in thin skin that contains hair follicles, sebaceous and sweat glands called the superficial fascia. The superficial fascia of the breast covers the pectoralis, serratus anterior and external oblique muscles of the chest. The pectoralis major muscle runs in an oblique line from the humerus to the midsternum. Separating the breast from the pectoral muscle is a layer of adipose tissue and connective fascia referred to as the retromammary space. Other identifying structures of the breast include the base, axillary tail and the inframammary crease. The base of the breast is the posterior surface overlying the pectoralis muscle***. (Wentz and Hill., 1997).***

Because the breast is loosely attached to the fascia covering the pectoralis major muscle, it is allowed to move over chest wall. The portion of breast extending from the base of the breast into the axillary fossa is called the axillary tail or Tail of Spence. The

inframammary crease or fold is the junction of the inferior portion of the breast with the anterior chest wall. ***(Hussain et al., 2003)***.

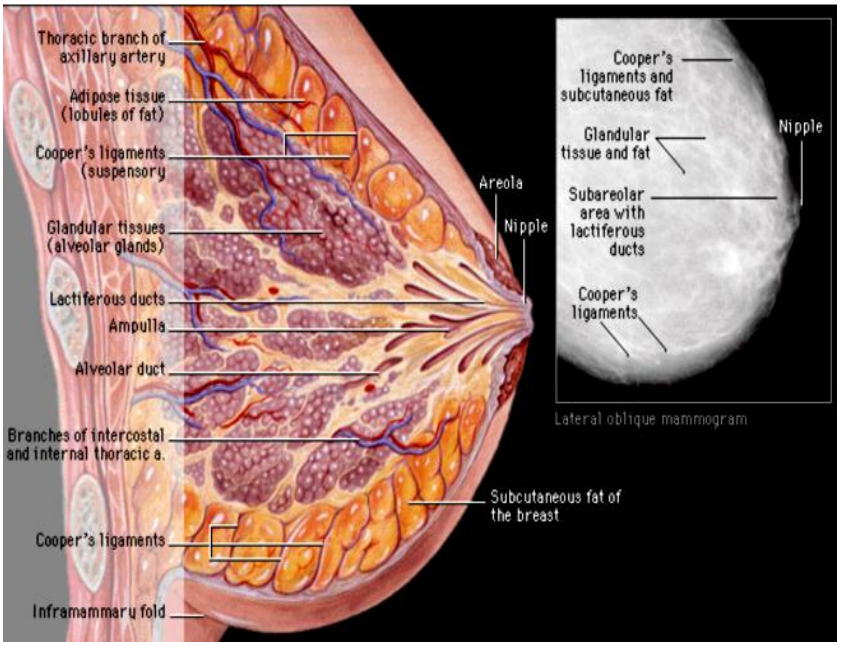


**Fig. (1):** Anatomy of the Breast. *(Hussain et al., 2003)*

The breast is made up of three types of tissues: fibrous, glandular and adipose. The fibrous and glandular tissues are generally described as one tissue– fibroglandular. Glandular tissue is primarily located in the central portion of breast and in the extending upper outer quadrant toward the axilla, surrounded by fibrous and adipose tissues. The glandular tissue is arranged in 15-20 lobes, with the fatty and fibrous tissue in between. The lobes are arranged like spokes of a wheel surrounding the nipple. Each lobe has a collecting duct called a lactiferous duct leading to the nipple. **Fig (1)** ***(Wentz and Hill., 1997)*** .

A network of fibrous / elastic bands called Cooper's Ligaments envelope the glandular tissue and act as a supporting framework for the breast. They extend from the deep skin layer through the mammary tissue to the deep fascia covering the pectoralis muscle. They can be foreshortened or straightened by fibrosis associated with breast cancer, causing skin retraction or localized architectural distortion. **Fig (2)** ***(American cancer society, 2010).***

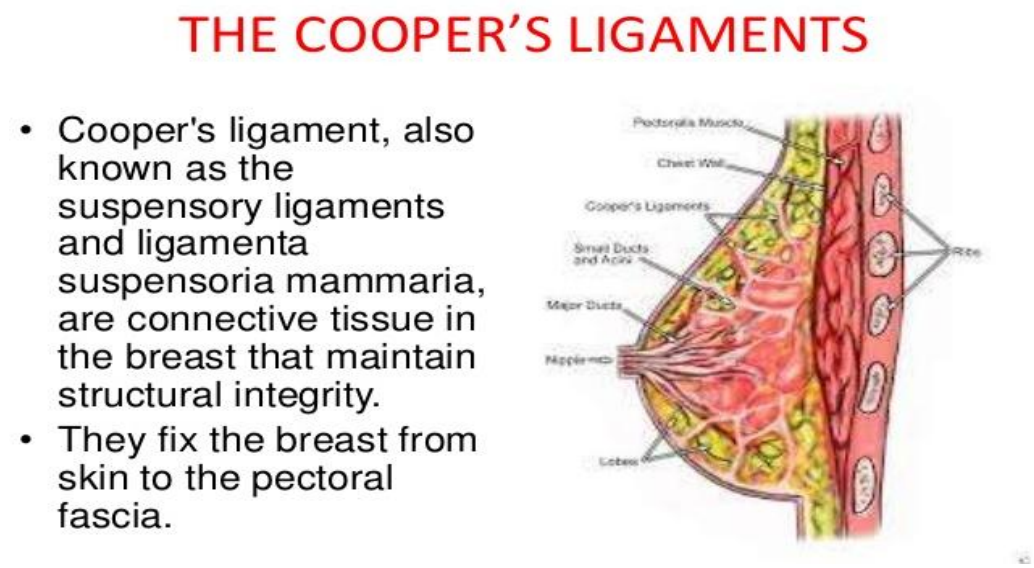


**Fig. (2):** Cooper's ligaments in breast anatomy.

The mammary glands are modified sweat glands that lie within the subcutaneous tissue of the breasts, between the pectoral fat pad and the fascia covering the pectoralis major muscle. They are normally mobile on this fascia. The mammary glands may extend beyond the breast toward the axilla, forming an axillary process or "axillary tail". The adult woman's mammary glands are arranged as fifteen to twenty separate lobes, with each lobe containing several secretory lobules **Fig (3)** ***(Andolina and Lippincot., 2001).***

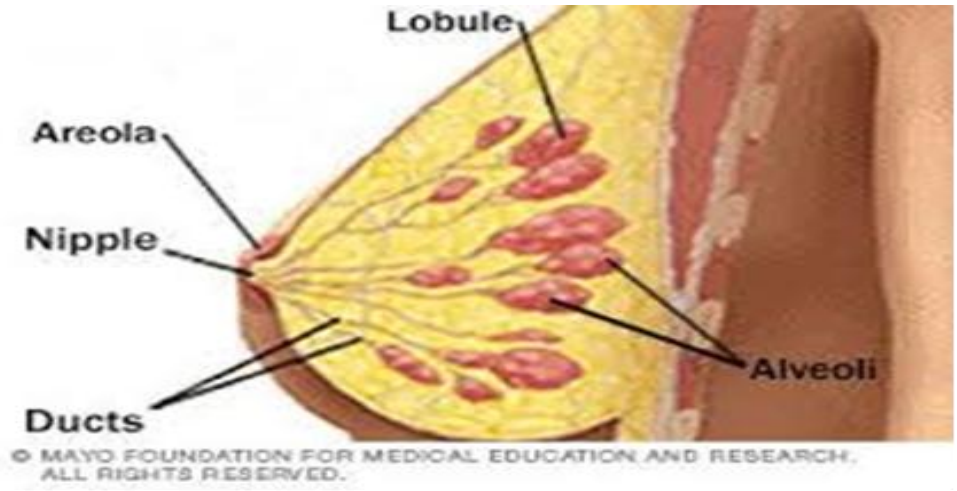


**Fig. (3):** The mammary glands views displaying lobes, lobules, and lactiferous ducts and sinuses.

The lobules are composed of grape-like clusters of alveoli, which are the hollow sacs that make and hold the breast milk . **Fig (**4**) (*Macéa and Fregnani., 2006).***Appropriate hormonal stimulation is necessary for milk production, as well as milk release. Milk leaves the lobules through numerous interlobular