



## Endoscopic Excision of Benign Breast lumps: A Review Article

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### ABSTRACT

Many women may be concerned about their health because benign breast disorders happen frequently from the early stages of pregnancy to the postmenopausal years. Benign breast disease is common among women. Conservative non-operative treatment and surgical excision are two options for managing benign breast tumours. Oncoplastic breast conserving surgery, which combines glandular replacement or rearrangement with strategically placed incisions, emerged as the gold standard for breast conserving surgery due to the need for more aesthetically pleasing results. Over the past 20 years, minimally invasive or minimum access breast surgery has received a lot of attention as patients and breast surgeons want better cosmetic results. This article aimed to review endoscopic excision for management of benign breast lumps.

**Keywords:** Benign Breast Lesions, Management, Endoscopic Surgery

### Introduction

Benign lesions of the breast are more common as compared to malignant with a peak incidence in the 2nd and 3rd decade. Clinical evaluation followed by histopathological assessment provided the accurate diagnosis (1).

Women older than age 40 should be evaluated initially with diagnostic mammography and supplemented with breast ultrasound as indicated. For young women, ultrasound is the preferred method of initial breast imaging. Mammogram and ultrasound findings are reported by the Breast Imaging Reporting and Data System (BI-RADS) classification that guides clinical decision making and the need for biopsy (2).

A new system has been developed and described which puts all the processes of physiological changes, growth development, and involution into a single framework called aberrations of normal development and involution (ANDI) (Table 1) (3).

A fibroadenoma is a painless, most common benign (non-cancerous) breast tumor that is a solid, not fluid-filled lump. Fibroadenomas are a marble-like mass containing both epithelial and stromal tissues found under the surface of the breast. These firm-rubbery masses with regular borders are often variable in size. It occurs most commonly in women between the ages of 14 to 35 years but can be found at any age (4). There are two types of fibroadenomas; the pericanalicular type (hard) has a whorly appearance with a complete capsule, while the intracanalicular type (soft) has an incomplete capsule (5). Ultrasonography is the best imaging method in young women for the evaluation of a simple breast fibroadenoma with the typical sonographic features (6).

There are even more statistics given for fibroadenomas that grow in size (0-53%), therefore require excision biopsy. The reported incidence of carcinoma or malignant change varies from 0.02 to 0.3%, usually to lobular carcinoma insitu. Furthermore, most of this reported carcinoma have been seen in women above 35years of age and this has been suggested as the cut- off age for conservative management of fibroadenomas (7).

**Table (1): ANDI classification of benign breast disorders (3).**

	<b>Normal</b>	<b>Disorder</b>	<b>Disease</b>
<b>Early reproductive years</b> (age 15–25 years)	Lobular development Stromal development Nipple eversion	Fibroadenoma Adolescent hypertrophy Nipple inversion	Giant fibroadenoma Gigantomastia Subareolar abscess Mammary duct fistula
<b>Later reproductive years</b> (age 25–40 years)	Cyclical changes of menstruation Epithelial hyperplasia of pregnancy	Cyclical mastalgia Nodularity Bloody nipple discharge	Incapacitating mastalgia
<b>Involution</b> (age 35–55 years)	Lobular involution Duct involution Dilatation Sclerosis Epithelial turnover	Macrocysts Sclerosing lesions Duct ectasia Nipple retraction Epithelial hyperplasia	Periductal mastitis Epithelial hyperplasia with atypia

### **Management of benign breast lesions**

It is important to carefully decide when to intervene versus when to observe because any intervention even as small as a biopsy may cause iatrogenic injury to the developing breast bud and result in permanent aesthetic deformity and disfigurement of the breast (8).

Breast lumps that are asymptomatic and rapidly enlarging nor causing any cosmetic deformity may be observed with yearly breast examination and ultrasound if necessary. However, if the patient does not feel comfortable with conservative approach, and if the fear of malignancy is causing significant anxiety, asymptomatic lump should be removed though it is advisable to observe for at least 3- 4 months before intervention (9).

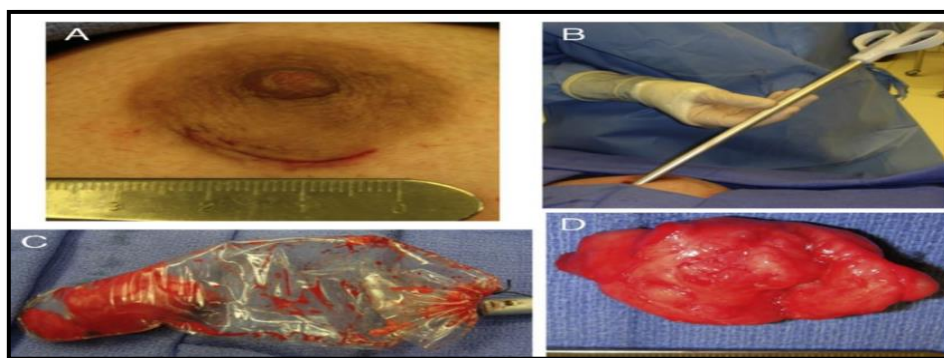
This is indicated for the lesions that are increasing in size, causing considerable pain, distorting the breast parenchyma, causing cosmetic deformity of the breast, persisting without any regression or when there are features in imaging or pathology that require malignancy to be ruled out (10).

Due to the development in medical technology, minimally invasive procedures have evolved in recent years. In general, such interventions result in significantly reduced breast scars, shorter hospitalization and less pain, but they require specific, expensive devices, longer surgical time compared to open surgery (11).

The “aesthetic scar-less” breast surgery can be defined as an operation wherein incisions are secured out of sight and minimized within the range of oncologic safety. Thus, the incision for this surgery can be designed on the inframammary fold, axillary area, periareolar area, or mid-axillary line, which can be hidden by the arms. To hide an operative scar, the axillary, inframammary, and periareolar (semi- or whole-circumareolar) incisions are good options, and for a single incision, a lateral incision can be selected. Recent advances in technology, such as endoscopic surgical instruments and robotic surgery systems, have made these approaches possible (12).

### **Endoscopic resection of benign breast lesions**

Minimally invasive Endoscopy-assisted breast surgery (EABS) techniques were developed in East Asia for the removal of breast both breast masses. Endoscopy was used in breast surgery initially by the plastic surgeons to evaluate for breast implant rupture or leakage of silicone but later on the scope widened to include tumor management (13). The operative technique involved the use of a single periareolar incision, dissection of the tumor free from the surrounding parenchyma, creation of flaps around the tumor, and subsequent retrieval of the specimen with an endoscopic plastic bag through the periareolar incision (Fig. 1). The tumor was removed intact for two of three patients, and morcellated and removed piecemeal for one patient. In follow-up, all three patients have had excellent cosmetic outcomes, no recurrences, and no postoperative complications (14).



**Fig. (1):** Endoscopic specimen pouch use in the removal of a giant fibroadenoma of the breast. (a) Image of a closed, small, cosmetic periareolar incision of the breast; (b) Insertion of the endoscopic specimen pouch into the wound before deployment; (c) Fibroadenoma removed intact within the endoscopic bag, (d) Giant fibroadenoma of 5 cm in diameter removed through a 1.5-cm surgical incision site (14).

◆ **Dual axillary and areolar incisions approach:**

The location and extent of the lump was evaluated by intraoperative ultrasonography (IOUS). Jelly containing methylene blue dye was injected for planning of surgical resection margins. Dual-incision over axillary and peri-areolar area was the most commonly used incision type. The small axillary incision was used for axillary staging procedures and dissection of the posterior surface of the breast parenchyma off pectoralis major fascia. The peri-areolar incision was used for the development of skin flap and resection of breast tumor (15).

◆ **Retromammary approach:**

The patient is placed in the supine position under general anesthesia. The upper limb on the operative side is raised and abducted. A 10-mm incision is made on the midaxillary line, and two, 5-mm incisions are made on the anterior axillary line at the caudal side of the 10-mm incision. The 10-mm incision is dissected further. Visiport is inserted through the 10-mm incision into the retromammary space under video assistance, and it is then removed. Preperitoneal dissection balloon system (covidien autosuture) is inserted via the 10-mm incision into the retromammary space to perform the dissection, and pressure is gradually applied by insufflating several times with an accompanying pump. After compression of the entire dissected area for approximately 3 min, the balloon is deflated and removed. A 10-mm blunt-tip balloon trocar is inserted via the 10- mm incision, a CO2 tube is connected to the port, and the dissected space is insufflated to a pressure of 8 mmHg. The 5-mm Origid scope is inserted from the trocar to check the dissected retromammary space. Two 5-mm trocars are

inserted via the previous 5-mm incision into the dissected space. Tumor location is identified by palpation, intraoperative ultrasound, or needle localization. Then, under video assistance, dissection of the benign lesions with a 5-mm grasping forceps, a monopolar coagulator, and a harmonic scalpel. The resected mass is pulled out directly through the 10-mm incision. If the mass is too large to extract, a small plastic bag is inserted into the dissected space into which the tumor is placed, which is then divided and pulled out within the bag. After adequate hemostasis, one small drain tube is inserted into the retromammary space via one of the 5-mm incisions. All incisions are then closed with intradermal sutures (16).

◆ **Transaxillary approach:**

In contrast to the other approaches, the transaxillary approach avoids the extensive dissection of the retromammary space and the possibility of perforator vessels injury. This approach allows resecting of the breast lump in any location without limitation, and without the necessity of making additional incisions in the breast. The cosmetic results have been decidedly favorable (17).

Transaxillary approach is much more preferred by patients as well; as a scar that is not noticeable is never the same as having no scar for patients. In this technique, patient is placed supine with ipsilateral upper limb abducted and extended so that the arm lies on the side of the patient's head. A 10 mm port in the mid axillary line at a level just above the nipple and two 5 mm ports along the anterior axillary fold two finger breadths above and below the first port. The 10 mm port was introduced through the skin incision and advanced towards the breast staying superficial to the muscles of the anterior axillary fold (Figure 2).

The breast tissue was entered for about 2- 3 cms. The trocar was removed and the sheath connected to the gas for insufflation and the 0 degree scope introduced. The space for access was then made by sweeping and darting movements of the telescope through the avascular loose areolar tissues. Once an adequate space was created two other 5 mm ports were made; two finger breadths above and below the 10 mm port. Subsequently, the dissection was done all around the lump with the use of a monopolar electrocautery. Once the lump was made free it was pulled towards the axilla and the 5mm scope introduced through one of the 5 mm port and finally the lesion was removed through the 10 mm port with the help of an extractor. The haemostasis was checked and a compression bandage done after dressing (17,18).

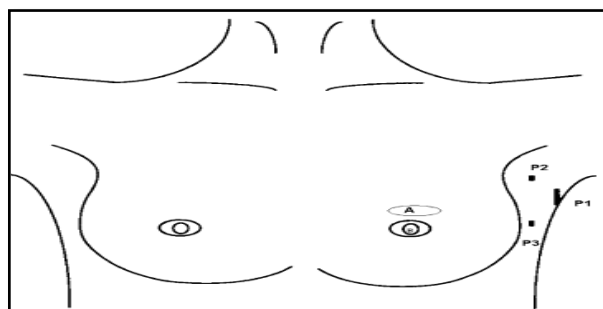
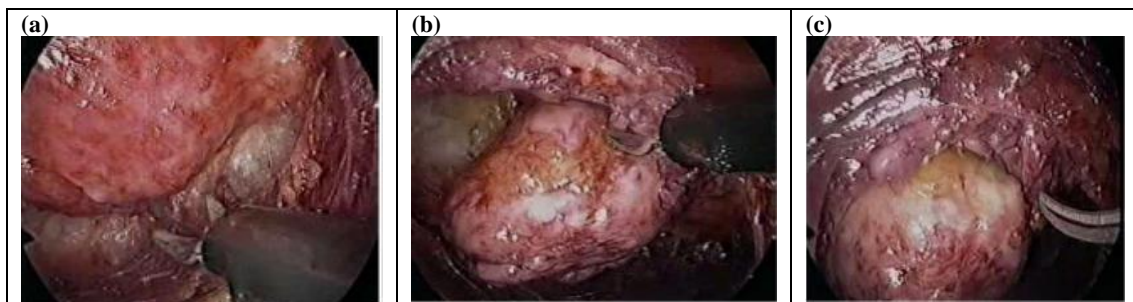


Fig. (2): Port sites. The lump position: P1 (10-mm port); P2 and P3 (5-mm ports).

Dissection is done along the avascular planes and limited to the area around the lesion. Risk of insult to the axilla is eliminated by staying above the anterior axillary fold (Figure 3). It is substantiated by absence of any axillary or upper limb deformity. The patient may have mild pain on the port site and is discharged the next morning (18).

The transaxillary approach can be a better alternative to circumareolar incision (CAI). Natural orifices transluminal endoscopic surgery (NOTES) is an exciting development (19). The NOTES technique is based on the concept of approaching the target lesion from a distant location (20). The axilla, although not a natural orifice, provides an anatomically contiguous area for creating an access (21).



**Fig. (3):** Transaxillary approach showing (a) dissection beginning at the undersurface of the lump; (b) dissection progressing around the lump; (c) excision of the lump nearing completion.

This has been tried in an anecdotal manner (22). Lumps in all quadrants of the breast could be excised. Any risk of insult to the axilla was averted by limiting the dissection superficial to the anterior axillary fold. This was substantiated by the absence of any axillary or upper limb morbidity (23).

All the women were discharged on the same day and resumed their normal routine within 3 days, as compared with a reported hospital stay of 3.5 days for similar procedures (23). Pain was insignificant because only paracetamol was used until 2 days after surgery (21).

## **CONCLUSION**

Endoscopic breast surgery techniques show mastery of technique in removing breast tissue through small axillary incisions without complications.

Transaxillary endoscopic excision is a safe and technically simple, and patient-friendly procedure.

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## **REFERENCES:**

- 1- Onstad, M., & Stuckey, A. (2013). Benign breast disorders. *Obstetrics and Gynecology Clinics*, 40(3), 459-473.
- 2- Johansson A., Christakou A., Iftimi A., Eriksson M., Tapia J., Skoog L., et al. (2021). Characterization of benign breast diseases and association with age, hormonal factors, and family history of breast cancer among women in Sweden. *JAMA Network Open*, 4(6), e2114716-e2114716.
- 3- Prasad, A., Jain, A., Gupta, A., & Meena, R. (2021). Clinicopathoradiological Study of Benign Breast Diseases. *Indian Journal of Endocrine Surgery and Research*, 16(2), 65.
- 4- Weaver, M., & Stuckey, A. (2022). Benign breast disorders. *Obstetrics and Gynecology Clinics*, 49(1), 57-72.

- 5- Kiran N., Henna N., Gohier A., Aslam A., Javaid F. and Akhter N. (2022). "Spectrum of Benign Breast Diseases in Surgically Excised Specimens: A Clinicopathological Study." *Pakistan Journal of Medical & Health Sciences* 16(06): 59-59.
- 6- Pearlman, M. D., & Griffin, J. L. (2010). Benign breast disease. *Obstetrics & Gynecology*, 116(3), 747-758.
- 7- Stachs, A., Stubert, J., Reimer, T., & Hartmann, S. (2019). Benign breast disease in women. *Deutsches Ärzteblatt International*, 116(33-34), 565.
- 8- Mannello, F., & Tonti, G. A. (2006). Benign breast diseases: classification, diagnosis, and management. *The Oncologist*, 11(10), 1132-1134.
- 9- Paepke, S., Metz, S., Brea Salvago, A., & Ohlinger, R. (2018). Benign breast tumours- diagnosis and management. *Breast Care*, 13(6), 403-412.
- 10- Tafra, L., Babiera, G. V., Skoracki, R. J., & Esteva, F. J. (2012). Management of benign breast lesions. *Advanced Therapy of Breast Disease. Shelton: People's Medical House*, 339-51.
- 11- Bland, K. I., Copeland, E. M., Klimberg, V. S., & Gradishar, W. J. (2023). *The Breast-E-Book: Comprehensive Management of Benign and Malignant Diseases*. Elsevier Health Sciences.
- 12- Lakoma, A., & Kim, E. S. (2014). Minimally invasive surgical management of benign breast lesions. *Gland surgery*, 3(2), 142.
- 13- Mok C. & Lai H. (2019). Endoscopic-assisted surgery in the management of breast cancer: 20 years review of trend, techniques and outcomes. *The Breast*, 46, 144-156.
- 14- Lai H., Lin H., Chen S., Chen T., Chen D. and Kuo J. (2017). "Endoscopy-assisted surgery for the management of benign breast tumors: technique, learning curve, and patient-reported outcome from preliminary 323 procedures." *World Journal of Surgical Oncology* 15: 1-9.
- 15- Kitamura K., Inoue H., Ishida M., Kinoshita J., Hashizume M. and Sugimachi S. (2001). "Endoscopic extirpation of benign breast tumors using an extramammary approach." *The American journal of surgery* 181(3): 211-214.
- 16- Osanai T., Nihei Z., Ichikawa W., et al. (2002). Endoscopic resection of benign breast tumours. *Surg Laparos and Endosc Perctan Tech*;12: 100-03.
- 17- Kitamura K., Hashizume M., Kataoka A., et al. (1998): Transaxillary approach for the endoscopic extirpation of benign breast tumors. *Surg. Laparos. and Endosc.*, 8: 277-9.
- 18- Agarwal B., Agarwal S., Gupta M. and Mahajan K. (2008). "Transaxillary endoscopic excision of benign breast lumps: a new technique." *Surgical endoscopy* 22: 407-410.
- 19- Rojananin S, Ratanawichitrasin A (2002) Limited incision with plastic bag removal of a large fibroadenoma. *Br J Surg* 89: 787–788.
- 20- Swanstrom LL (2006) Current technology development for natural orifice transluminal endoscopic surgery. *Cir Esp* 80: 283–288
- 21- Agarwal, B., Agarwal, S., Gupta, M., & Mahajan, K. (2008). Transaxillary endoscopic excision of benign breast lumps: a new technique. *Surgical endoscopy*, 22, 407-410.
- 22- Kitamura K, Hashizume M, Kataoka A, Ohno S, Kuwano H, Maehara Y, Sugimachi K (1998) Transaxillary approach for the endoscopic extirpation of benign breast tumors. *Surg Laparos and Endosc* 8: 277–279.
- 23- Osanai T, Nihei Z, Ichikawa W, Sugihara K (2002) Endoscopic resection of benign breast tumors. *Surg Laparos and Endosc Perctan Tech* 12: 100–103.