



## Minimally invasive excision of gynaecomastia – a novel and effective surgical technique

O QUTOB<sup>1</sup>, B ELAHI<sup>2</sup>, V GARIMELLA<sup>1</sup>, N IHSAN<sup>2</sup>, PJ DREW<sup>1</sup>

<sup>1</sup>Academic Surgical Unit, University of Hull, Cottingham, UK

<sup>2</sup>Breast Care Unit, Hull and East Yorkshire Hospitals NHS Trust, Cottingham, UK

### ABSTRACT

**INTRODUCTION** More aesthetically acceptable treatment options have been sought to minimise the morbidity associated with open surgery for gynaecomastia. This study investigated the use of a vacuum-assisted biopsy device (VABD) and liposuction to provide minimally invasive approach.

**PATIENTS AND METHODS** Patients diagnosed with idiopathic benign gynaecomastia referred to the Breast Care Unit of Castle Hill Hospital between June 2002 and April 2007 and requesting surgical intervention underwent VABD excision and liposuction. All patients underwent thorough investigations to exclude any underlying cause for their gynaecomastia. The procedure was carried out by a single consultant surgeon with special interest in breast surgery. An 8-G mammotome probe was advanced through a 4-mm incision positioned in the corresponding anterior axillary line to excise the glandular disc. Liposuction was performed through the same incision. Incision wounds were closed with Steristrips. A pressure dressing was applied over wound by corset and an inflatable device.

**RESULTS** Thirty-six male patients with grade I and II gynaecomastia were recruited (22 bilateral, 14 unilateral). Average age was 33.3 years (range, 16–88 years). All underwent mammotome excision and liposuction. There were no conversions to an open procedure. The average procedure time was 50.3 min (range, 30–80 min). One intra-operative complication was recorded. The minimum follow-up time was 2 months. Thirty-four patients reported excellent satisfaction, two patients had residual gynaecomastia and needed a re-do procedure. Three patients developed small haematomas that resolved spontaneously.

**CONCLUSION** This novel, minimally invasive, surgical approach for gynaecomastia gives excellent results with minimal morbidity.

### KEYWORDS

Gynaecomastia – Vacuum-assisted biopsy device – Liposuction

### CORRESPONDENCE TO

Philip J Drew, Academic Surgical Unit, 231–232 Hertford Building, University of Hull, Cottingham Road, Hull HU6 7RX, UK

T/F: +44 (0)148 246 3299; E: philip.drew@hyms.ac.uk

Gynaecomastia is abnormal enlargement of male breast tissue. It is differentiated from the prominence of breast due to excessive deposition of adipose tissue in obesity which is termed pseudo gynaecomastia or lipomastia. There have been two main attempts to classify the severity of gynaecomastia. In 1934, Webster classified gynaecomastia into three types according to the predominant type of tissue in to glandular, fatty or mixed type. Subsequently, in 1973, Simon *et al.*<sup>1</sup> described a classification based on size of gynaecomastia<sup>1</sup>. According to this, minor visible enlargement of breast without redundant skin was classed as grade 1. Grade 2A gynaecomastia included moderate breast enlargement with no redundant skin and grade 2B moderate enlargement with minor redundant skin. Grade 3 gynaecomastia was defined as gross enlargement with skin redundancy with ptosis of breast.

Gynaecomastia is the most common disorder of male breast accounting nearly 60% of all male breast disorders. It also accounts for 85% of male breast masses. Its prevalence shows a trimodal pattern. It is estimated that 60–90% of newborn infants have transient gynaecomastia due to maternal oestrogens. The next peak is during puberty with prevalence of 30–60% (with 50–60% bilateral) and is thought to be due to a transient rise of oestrogen concentration at puberty before testosterone in boys who develop gynaecomastia. The usual age is between 10–12 years. It is usually self-limiting and regresses in 18–24 months. It is rare to persist beyond 20 years of age. The third peak occurs in older men commonly termed senescent gynaecomastia with prevalence between 24–72% with a peak at age 50–69 years (72%).

The first description of surgical treatment for gynaecomastia was made by Paulus Aegineta (635–690 AD), a

Byzantine Greek physician who described breast reduction mammoplasty using a semi lunar inframammary incision. Several treatments regarding gynaecomastia have been described in literature since the 19th century. Subcutaneous mastectomy as a treatment for gynaecomastia was first described by Thorek in 1942 and later by Webster in 1946; it was the treatment of choice up to the 1980s. In the last 35 years, more attention has been paid to aesthetically acceptable and minimally invasive approaches in the surgical management of breast diseases. Teimourian and Perlman,<sup>2</sup> in 1983, described liposuction-assisted excision. In the 1990s, ultrasound-assisted liposuction was introduced with success in 87% of cases with various grades of gynaecomastia.<sup>3</sup> However, surgery for gynaecomastia is associated with significant morbidity.<sup>4</sup> In the last few years, the use of a vacuum-assisted biopsy device (VABD), originally introduced as a diagnostic tool for radiologically-guided, vacuum-assisted, breast biopsies has proven beneficial to the treatment of gynaecomastia.<sup>5</sup> We report a case series of patients undergoing mammotome resection of gynaecomastia.

## Patients and Methods

### Study cohort

A series of 36 patients diagnosed with idiopathic benign gynaecomastia between June 2002 and April 2007 and requesting surgical intervention, underwent VABD (Mammotome; Ethicon, Endosurgery, Cincinnati, OH, USA) excision of their gynaecomastia combined with liposuction. All patients underwent clinical (history and physical examination), radiological (mammograms and ultrasound) and full hormonal assays including leutinising hormone, follicular-stimulating hormone, testosterone, oestradiol, prolactin and the testicular tumour markers B-HCG and  $\alpha$ -fetoprotein. They also underwent liver function and thyroid function tests, to exclude an underlying cause of their gynaecomastia. Three out of the 36 patients had a medical therapy trial with tamoxifen for at least 4 months which failed and subsequently went onto mammotome intervention. All patients gave informed consent for the mammotome excision. The procedure was carried out by a consultant surgeon with special interest in breast surgery at the Breast Care Unit. Fourteen patients had unilateral procedures and 22 had bilateral excisions.

### Procedure

A 4-mm incision at the corresponding anterior axillary line was made and the mammotome probe (8-G) advanced towards the hypertrophied breast disc area. The mammotome device allows the sequential resection of the firmer breast discs via a suction facility without the need to withdraw the probe. The probe was always directed away from the skin to avoid suctioning the skin into the cutting cham-

ber. The area was subsequently infiltrated with Hartman's solution with 1 in 500,000 adrenaline to facilitate liposuction and to minimise bleeding. Any defect resulting from the mammotome excision was finalised and good contour achieved by using the standard liposuction. All 36 patients received liposuction following mammotome excision. Where necessary, liposuction was performed below the inframammary fold in order to facilitate re-draping of the skin of the chest wall.

Following the procedure, manual pressure was applied to the area whilst the stab incision was closed with a Steristrip. Pressure dressing was then applied over the wound by corset and an inflatable device to minimise the occurrence of haematomas. The inflatable device was removed in recovery whilst the corset was kept for 6 weeks postoperatively. Two patients were discharged the following day for logistical reasons whilst the rest of the patients went home on the same day.

### Follow-up

All patients were seen in the out-patient clinic 6–8 weeks postoperatively. Patients' opinion and level of satisfaction was obtained and graded as poor, average, good, or excellent. A further scoring system (Visual Analogue Score) was used by the operating surgeon grading the cosmetic outcome between 0 and 10 where 0 was considered the worst cosmetic result achieved and 10 was the best possible cosmetic result. This scoring system took into consideration the symmetry, scarring and the overall natural appearance. All postoperative complications were recorded.

## Results

Thirty-six male patients with grade I and II gynaecomastia (14 unilateral, 22 bilateral gynaecomastia) underwent mammotome excision of their gynaecomastia. There were no conversions to an open procedure. All patients underwent liposuction as well as mammotome resection. The mean age was 35.3 years (range, 16–88 years). The average procedure time was 50.5 min (range, 30–80 min). One patient had a small area of areola excised as the skin was suctioned into the cutting chamber of the mammotome during the procedure. At follow-up, 34 patients reported excellent satisfaction while two had residual gynaecomastia and needed a re-do procedure. The surgeon's scoring mean was 7.9 (range, 4–9). Three patients had small haematomas at their first out-patient clinic appointment but all resolved spontaneously by the time they came for a second and final visit. Histology was reported as benign gynaecomastia in all patients.

## Discussion

Gynaecomastia is the commonest, benign, breast pathology in males. The main goal of treating this condition is to

remove the excess breast tissue achieving the best symmetry with minimal scarring. Until recently, surgery in the form of subcutaneous mastectomy has been the mainstay of treatment of gynaecomastia, but this could result in taking excess breast tissue leading to asymmetry of the chest or even tethering of the nipple to the pectoral muscle giving a significant deformity. Other complications of subcutaneous mastectomies included keloid formation of the scar, nipple necrosis and altered peri-areolar sensation.<sup>4</sup>

More recently, however, other surgical techniques have been described, such as the endoscope-assisted subcutaneous mastectomy offering a smaller incision; however, this technique did not totally eliminate a potential complication of the scar on a visible part of the chest.<sup>6</sup>

The combined peri-areolar incision and liposuction successfully removed the glandular and fatty element of the condition but, once more, the potential complications of an open procedure mentioned above remained present.

Another effective technique recently published is the correction of gynaecomastia through a single puncture incision at the 6-o'clock position of the areola combined with a separate incision for liposuction at the anterior axillary fold; again, this procedure, places the incision in a prominent position, and will be unsightly should hypertrophy of the scar occur.<sup>7</sup> The procedure also adds another incision for liposuction compared to our approach of removing the glandular and fatty elements through one incision concealed in the anterior axillary fold.

Benefits of the mammotome are similar to those of minimal invasive procedures in surgery in general, such as the decreased morbidity, better cosmetic result, less recovery time and shorter hospital stay. The purely diagnostic aspect of the mammotome biopsy can be performed under local anaesthetic and can be done in the out-patient clinic setting.<sup>8</sup> Further to our initial study, published in 2004, the procedure was performed without ultrasound guidance; nevertheless, we achieved equally excellent results and patient satisfaction.<sup>9</sup> Although a comparative study with open surgery would have been ideal, there were no details of open surgery available at our institution.

## Conclusions

Our experience with minimally invasive breast surgery for gynaecomastia continues to give excellent results of cosmesis with minimum morbidity. Mammotome and liposuction may become the method of choice for the surgical management of gynaecomastia; nevertheless, further studies are encouraged in this area. A randomised, controlled trial comparing the minimally invasive approach to an open technique should help establish the best surgical option for this common condition.

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